

Applying the Principles of Implementation Science to Precision Public Health

David Chambers, DPhil

Deputy Director for Implementation Science,
Division of Cancer Control & Population Sciences (DCCPS)

Session Outline

- A Very Brief Orientation to Implementation Science
- Considering Implementation Science within Precision Public Health?
- Challenging Existing Assumptions

We assume... “If you build it...”



...It might take 108 years for this

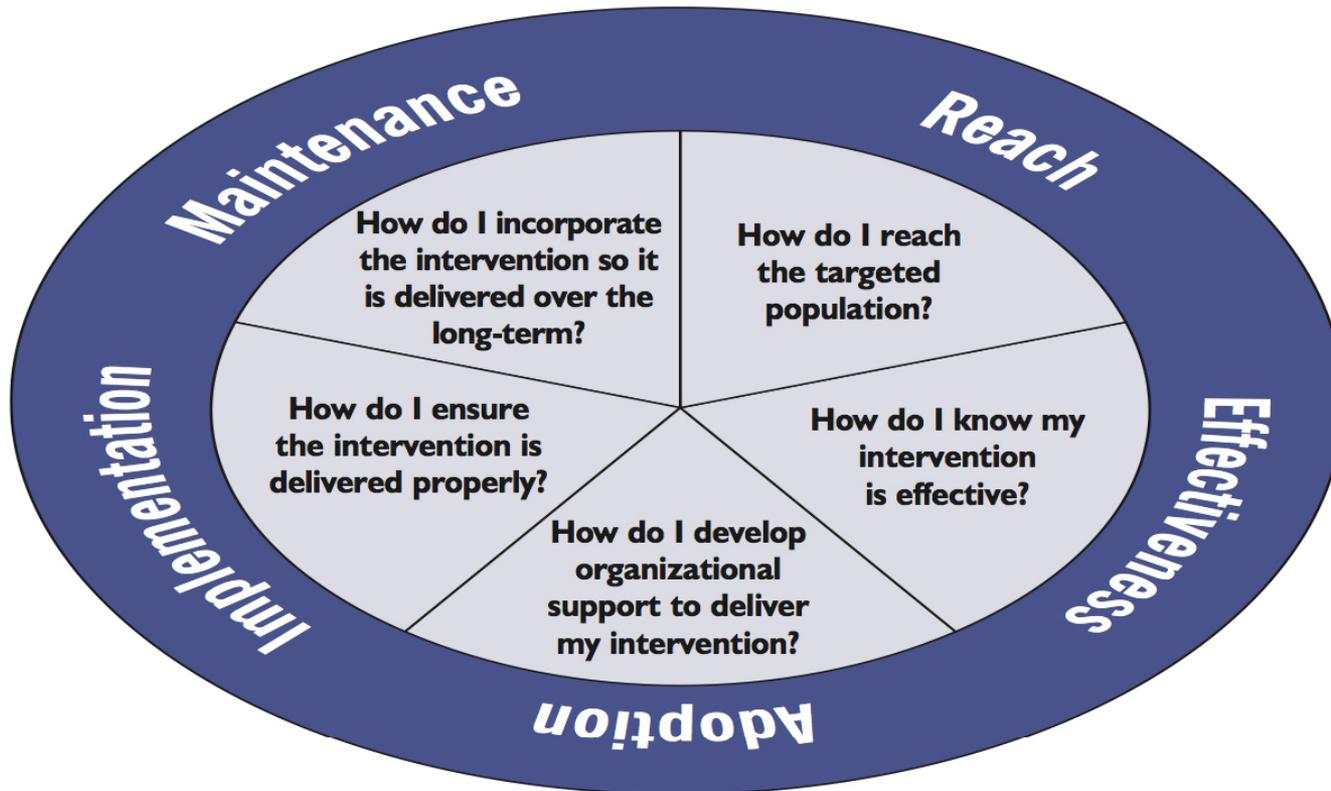


A Challenge from Multiple Perspectives...



Beyond efficacy/effectiveness

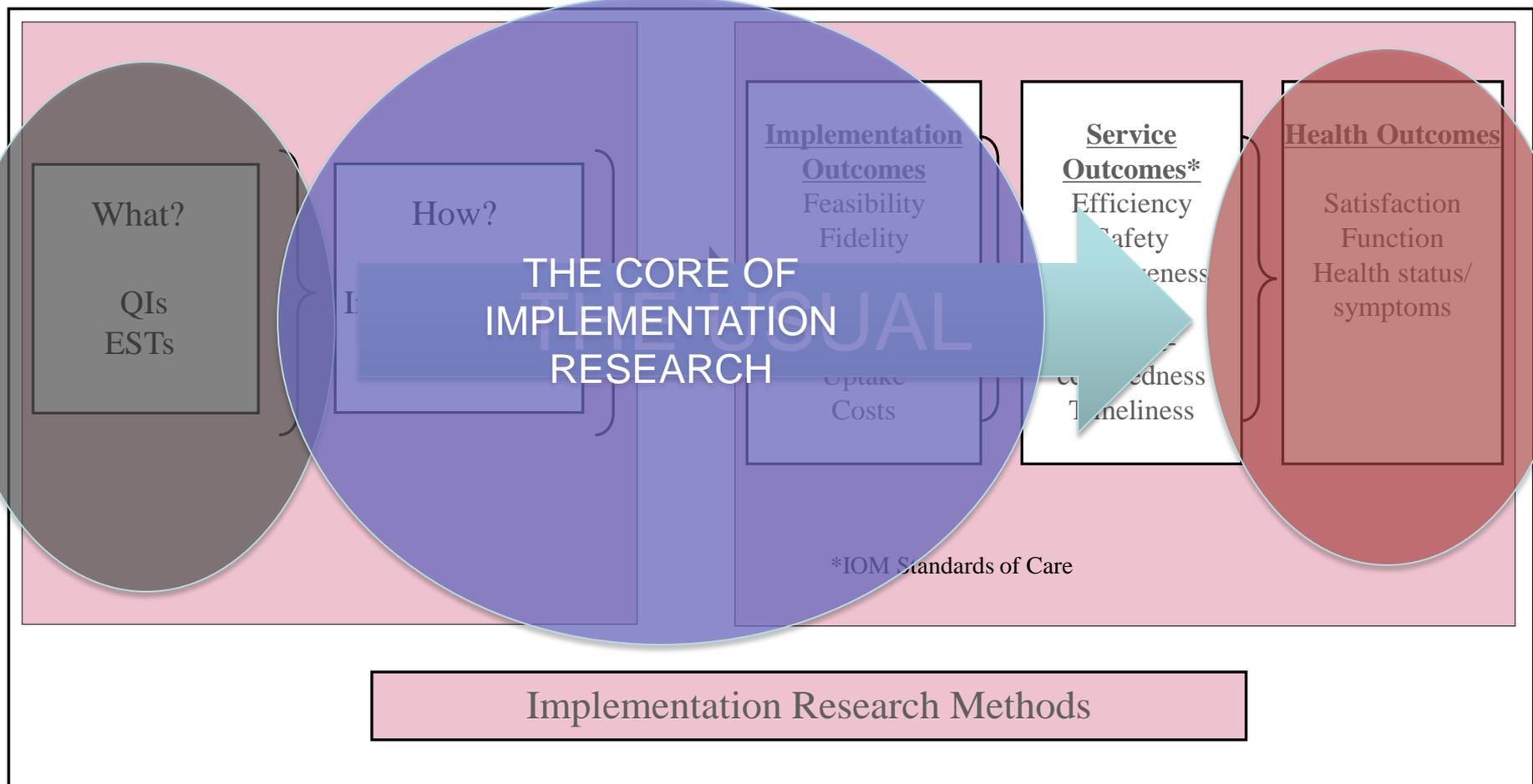
FIGURE 1. Elements of the RE-AIM Framework



Key Terms

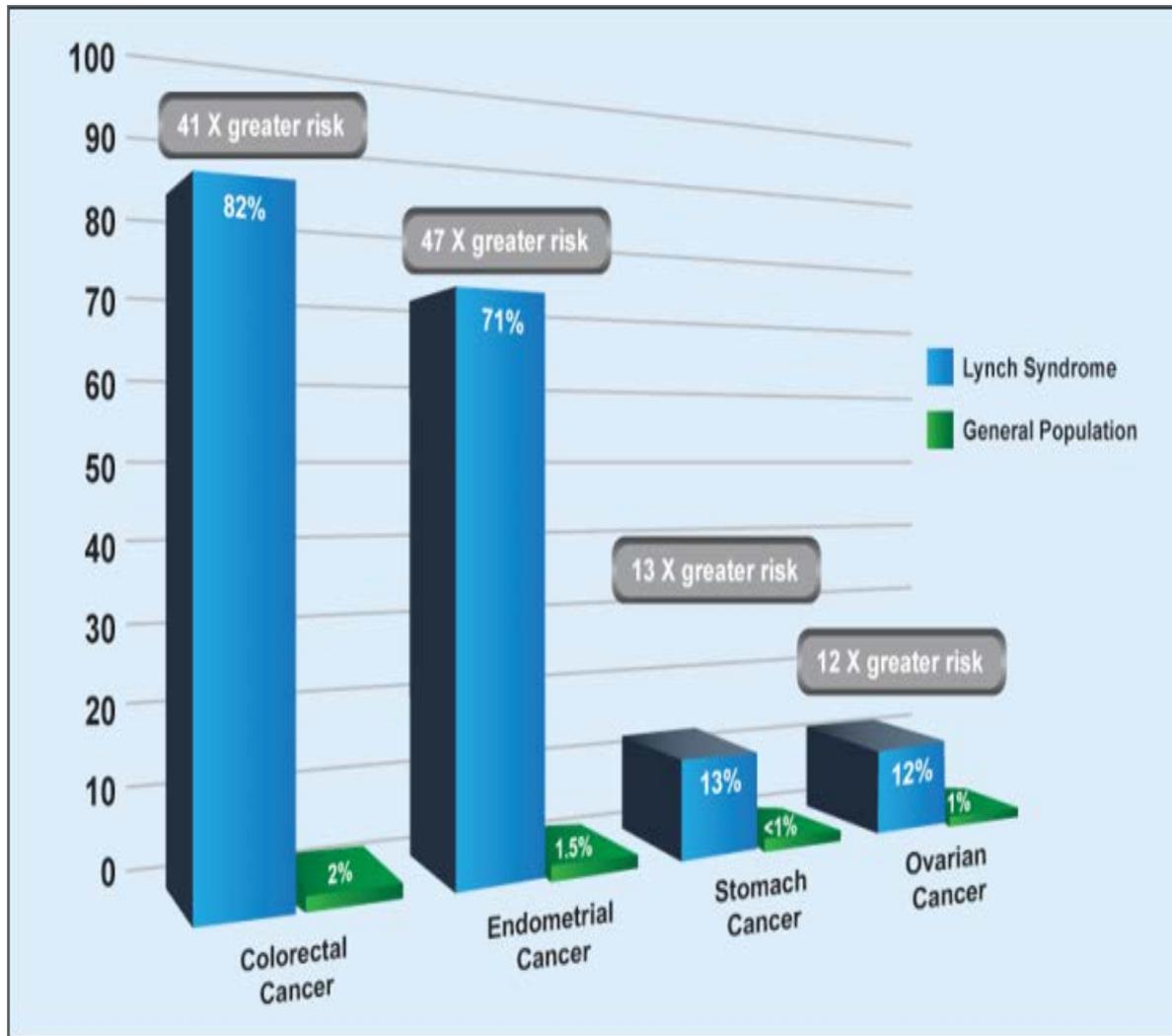
- **Implementation Science** is the study of methods to promote the integration of research findings and evidence into healthcare policy and practice.
- **Dissemination research** is the scientific study of targeted distribution of information and intervention materials to a specific public health or clinical practice audience. The intent is to understand how best to spread and sustain knowledge and the associated evidence-based interventions.
- **Implementation research** is the scientific study of the use of strategies to adopt and integrate evidence-based health interventions into clinical and community settings in order to improve patient outcomes and benefit population health.

Studying Implementation



Proctor et al, 2009, *APMH&MHSR*

Example: Lynch Syndrome



Sample IS Challenges:

- ID of Lynch Syndrome within general pop
- Family member scale-up
- Implementing screening/monitoring/

Example: PMI

THE PRECISION MEDICINE INITIATIVE®

WHAT IS IT?

Precision medicine is an emerging approach for disease prevention and treatment that takes into account people's individual variations in genes, environment, and lifestyle.

The Precision Medicine Initiative® will generate the scientific evidence needed to **move the concept of precision medicine into clinical practice.**

WHY NOW?

The **time is right** because of:

- Sequencing of the human genome
- Improved technologies for biomedical analysis
- New tools for using large datasets

Sample IS Challenges

- How does clinical practice incorporate PMI findings?
- How do you implement evidence that will be evolving?
- How do you train and support the workforce?
- What services will be covered/paid for?

Traditional Assumptions

- Evidence and Evidence-based practices are static
- System is static
- Implementation proceeds one practice or test at a time
- Consumers/Patients are homogeneous
- Choosing to not implement is irrational

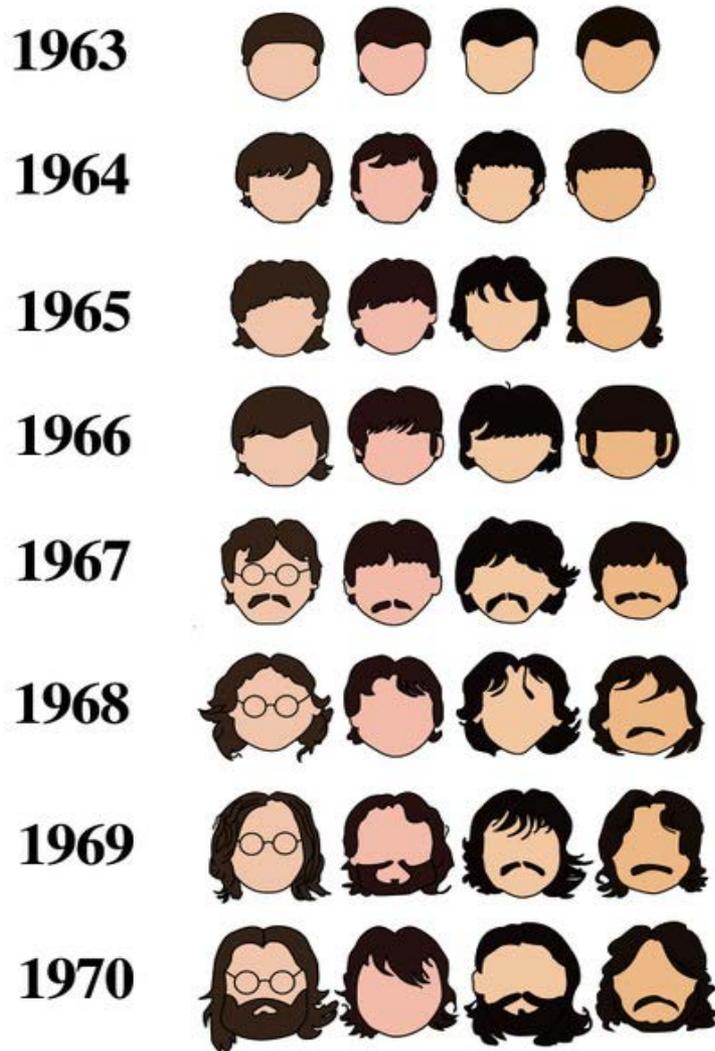
How well do these relate to the implementation of precision medicine?

Choosing not to implement is irrational... (Does it fit?)



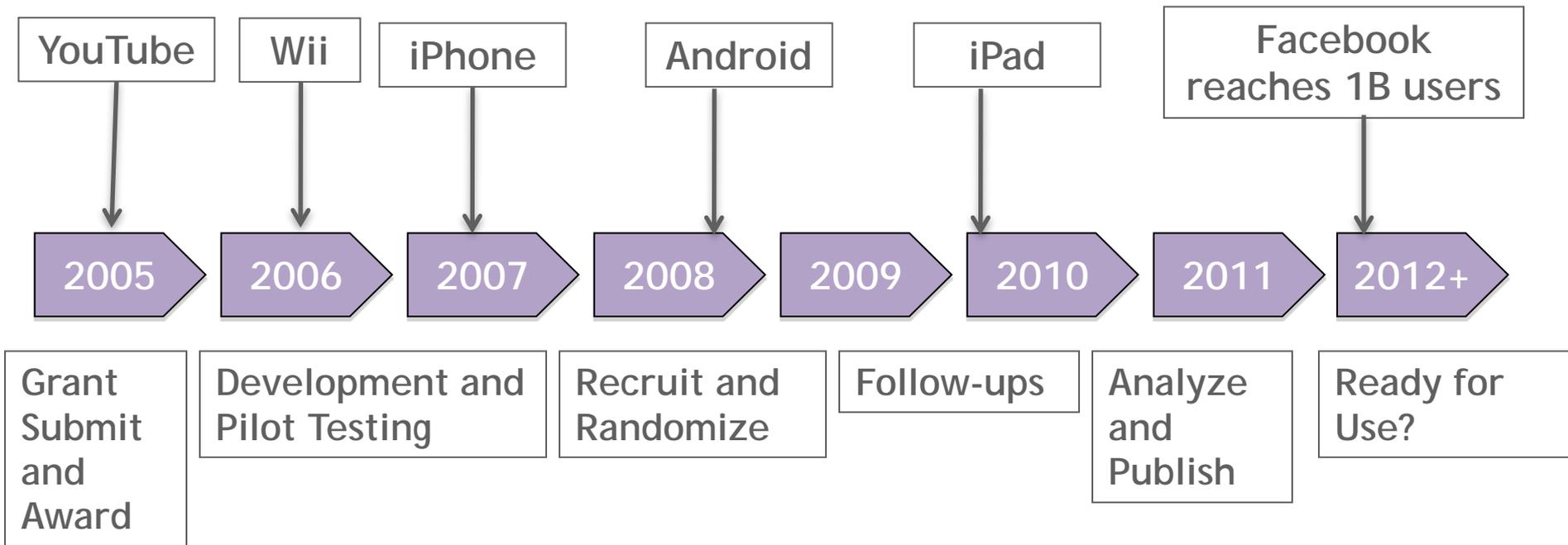
- QUESTIONS ABOUT “ACTIONABILITY”
- WHAT IS REIMBURSED?
- IS COUNSELING AVAILABLE?
- ARE EXISTING TESTS OPTIMAL?
- IS THERE A DEMAND FOR THE KNOWLEDGE?

Sustainability or Evolution?



- IF PRECISION MEDICINE CONTINUES TO EVOLVE, SHOULD EXISTING INTERVENTIONS BE SUSTAINED IN THE SAME FORM THAT WE'VE CREATED THEM?
- HOW DOES THE SYSTEM COPE WITH A DYNAMIC FIELD THAT IS CONSTANTLY CHANGING?
- WHERE DO WE GO FROM HERE?

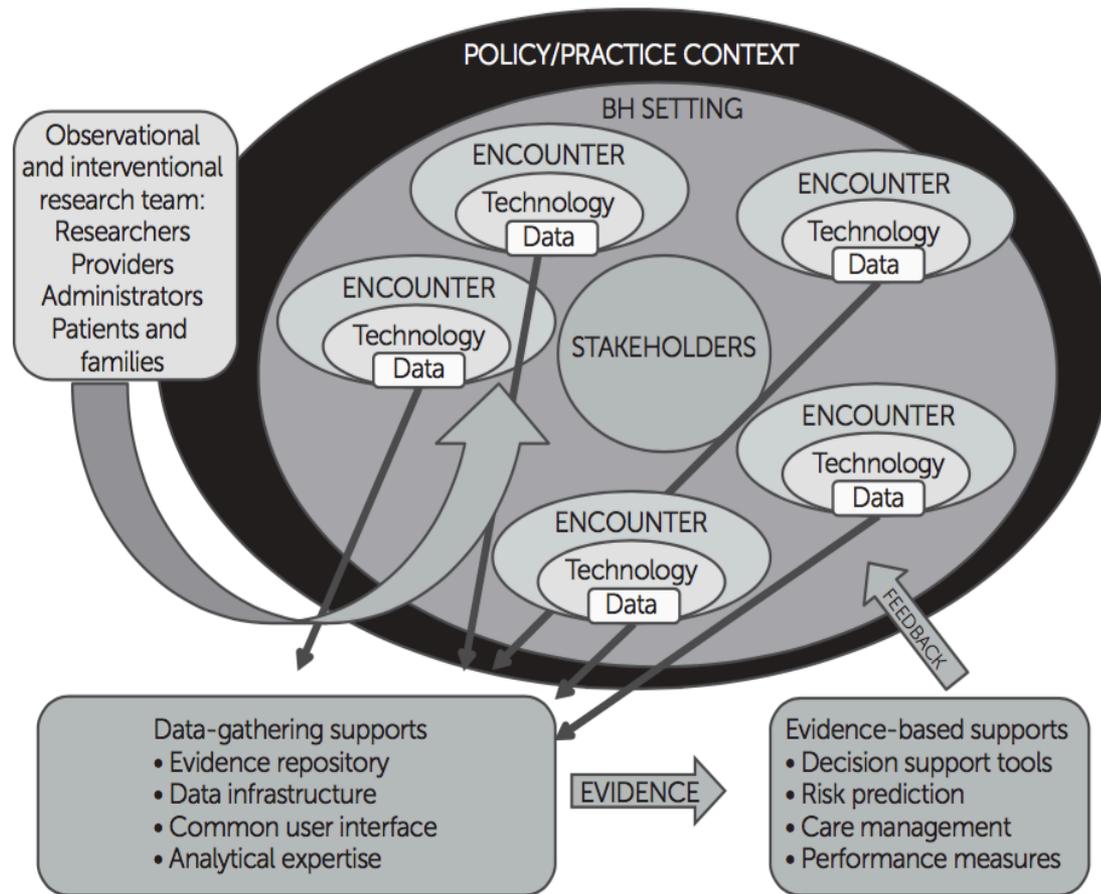
How to Evaluate Innovations that Outpace Usual Research Timelines?



Adapted from Riley et al, 2013

Enter the learning health care system...

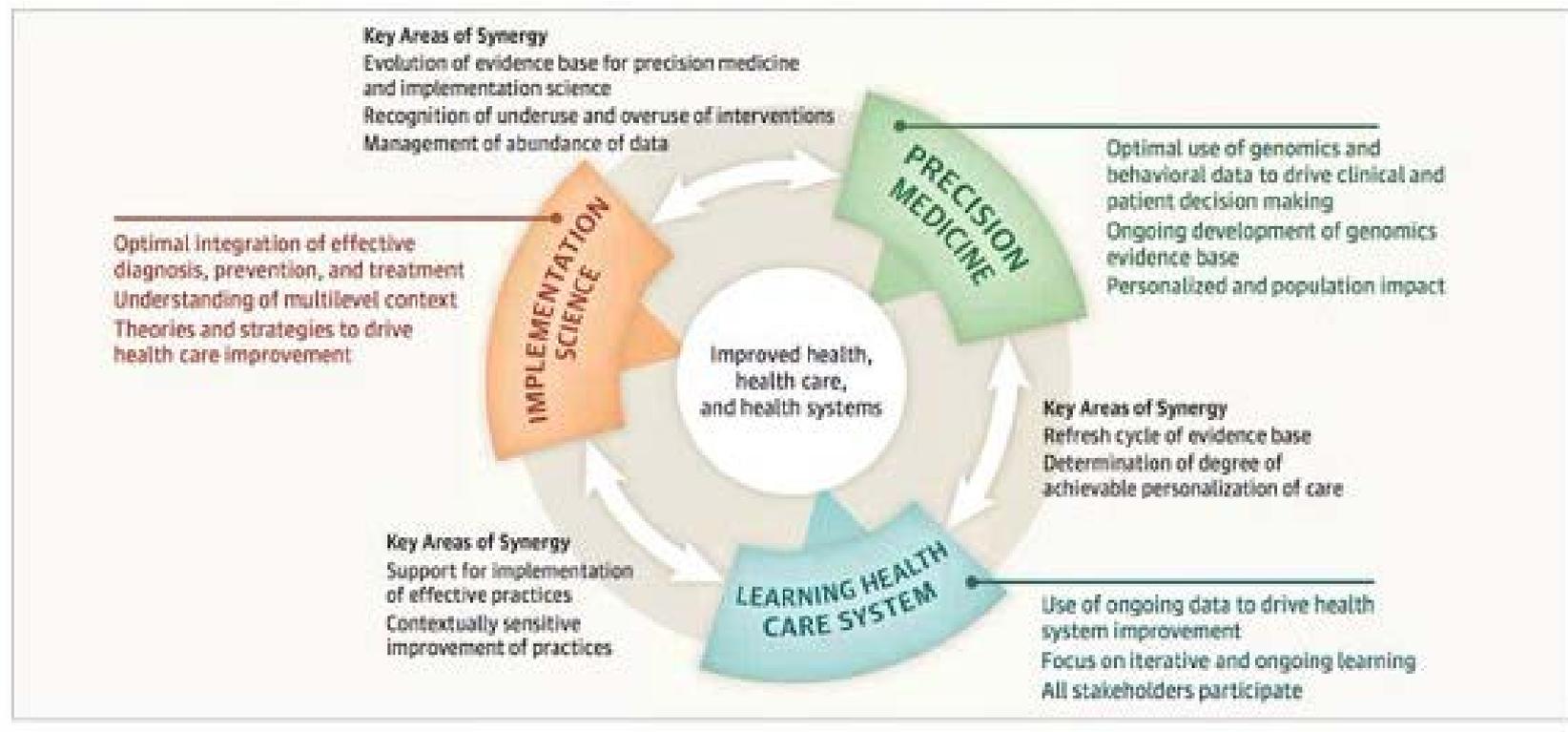
FIGURE 1. Collection and use of data to inform decision making by stakeholders in a learning behavioral health care (BH) system^a



Stein, Adams, Chambers. *Psychiatric Services*, 2016.

Hope for the future...

Figure. Contributions of Implementation Science, Learning Health Care System, and Precision Medicine



Chambers DA, Fears WG, Khoury MJ. Convergence of Implementation Science, Precision Medicine, and the Learning Health Care System. *Journal of the American Medical Association*. 2016;316(12):1251-1252.

Current Funding Announcements

- NIH: PAR-16-237; 16-238;16-236 (R03, R01, R21)
- NCI leads (16 ICs total, including FIC, NIMH, NHLBI, NHGRI, as well as OBSSR)
- Organizes the D&I research agenda across NIH
- >150 grants funded through NIH since 2006
- 2010 CSR standing review committee

Selected Priority Areas for PARs

- Studies of the **local adaptation** of evidence-based practices in the context of implementation
- Longitudinal and follow-up studies on the factors that contribute to the **sustainability** of evidence-based interventions
- **Scaling up** health care interventions across health plans, systems, and networks
- **De-Implementation** of ineffective or suboptimal care

Guiding Principles for IS & PPH...

- First, context matters and is multilevel.
- Second, it's not just whether a practice works, but whether that practice can be delivered in many real-world settings.
- Third, there are effective strategies to implement evidence-based practices.
- Fourth, implementation science is a team sport. Partnerships needed with a range of stakeholders, including patients, clinicians, administrators, researchers, and policy makers.

**THANK
YOU**

dchamber@mail.nih.gov
240-276-5090
@NCIDACHambers



**NATIONAL
CANCER
INSTITUTE**

www.cancer.gov

www.cancer.gov/espanol