Introduction Webinar

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Dissemination Science & Designing for Dissemination

Training Institute for Dissemination and Implementation Research in Health

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Objectives

1. Describe the underpinnings of D&I research.
2. Begin to understand the differences between dissemination research, research dissemination, and implementation research.
3. Explore some dissemination research topics (illustrated with policy research).
4. Describe the principles of designing for dissemination and how these may improve your work.

The Gap: Scurvy

What progress have we made in getting evidence into practice?

Total elapsed time from Lancaster to adoption: 264 years

104 years	146 years	48 years	70 years

1497 — Vasco da Gama: 100 of 160 crew died of scurvy; citrus suspected as cure

1601 — Capt James Lancaster sails with 4 ships: crew on Ship #1 given 3 tsps of lemon juice daily; 0% mortality. 40% of crew on other 3 ships perish.

1747 — James Lind, British Navy physician conducts random trial of 6 treatments for scorbutic sailors on HMS Salisbury: citrus again proves effective against scurvy

1795 — British Navy orders that citrus fruits become the diet on all navy ships.

1865 — British Board of Trade adopts the innovation, ordering proper diets on merchant vessels.

http://greas.ca/publication/pdf/melaniebarwickenglish.pdf

Balas & Boren, 2000

Original research

18%

Dickersin, 1987

Negative results

variable

Submission

It takes 17 years to turn 14 percent of original research to the benefit of patient care

Poynard, 1985

Reviews, guidelines, textbook

9.3 years

Inconsistent indexing

Implementation

“PUBLICATION PATHWAY”

An Evidence-Based PA Intervention

Is only so good as how and whether…

- It is adopted?
- Practitioners are trained to deliver it?
- Trained practitioners choose to deliver it?
- Eligible populations receive it?

If we assume 50% threshold for each step…
(even w/perfect access/adherence/dosage/maintenance)

Impact: .5*.5*.5*.5 = 6% benefit

Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *Am J Public Health.* Sep 1999;89(9):1322

Too often, we have assumed…
"If you build it…"

Some Remedies

- ***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/population outcomes.

From: NIH PAR 16-238: Dissemination and Implementation Research in Health (R01)

Dissemination vs. implementation (some fairly arbitrary distinctions)

	Dissemination	Implementation
Characteristic	More messy	More structured (perhaps)
Level	Policy and media level	Organizational and clinic level
Target	Community/whole population	Specific settings/ smaller groups/ individuals
Goals	Spread, sustain	Adopt, integrate
Topic	All levels: primary, secondary, tertiary prevention	All levels: primary, secondary, tertiary prevention

What we know, dissemination*

1. Dissemination generally does not occur spontaneously and naturally;
2. Passive approaches to dissemination are largely ineffective;
3. Single-source prevention messages are generally less effective than comprehensive, multilevel approaches;
4. Stakeholder involvement in the research or evaluation process is likely to enhance dissemination;
5. Theory and frameworks for dissemination are beneficial; and
6. The process of dissemination needs to be tailored to various audiences

*These all inform D&I research

Key Characteristics of D&I Science

Point #	Characteristic	Implication
Systems Perspective		
1	Context is critical	Research should focus on and describe context
2	Multilevel complexity	Most problems, and interventions are multilevel and complex
3	Focus on systems characteristics	More emphasis needed on interrelationships among system elements and systems rules
Robust, Practical Goals		
4	Representatives and reach	Focus on reaching broader segments of population and those most in need
5	Generalizability	Study generalization (or lack of such) across settings, subgroups, staff, and conditions
6	Pragmatic and practical	Producing answers to specific questions relevant to stakeholders
7	Scalability and sustainability	From outset, greater focus on scale-up potential and likelihood of sustainability
Research Methods to Enhance Relevance		
8	Rigorous	Identify and address plausible threats to validity in context of question. Greater focus on replication
9	Rapid	Approaches that produce faster answers
10	Adaptive	Best solutions usually evolve over time, as a result of informed hypotheses and mini-tests with feedback
11	Integration of methods; triangulation	For greater understanding, integrated Quantitative and Qualitative methods are often required
12	Relevance	Relevance to stakeholders should be top priority
Flexibility		
13	Multiplicity	Encourage and support diverse approaches with the above characteristics (all models are wrong)
14	Respect for diverse approaches; humility	Different perspectives, goals, methods and approaches are needed. Continuing the same existing approaches will produce the same unsatisfactory results

Glasgow RE, Chambers D. Developing robust, sustainable, implementation systems using rigorous, rapid and relevant science. *Clin Transl Sci.* Feb 2012;5(1):48

Is it research dissemination or dissemination research?

- Most research dissemination has been passive
- Federal agencies fund both research dissemination and dissemination research

Policy dissemination research

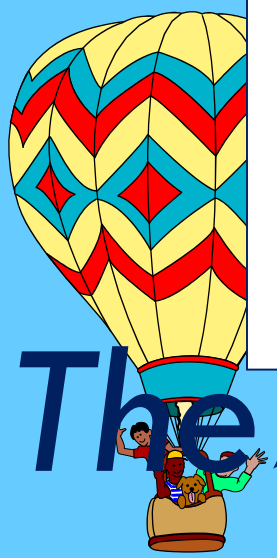
The big picture impact: Top 10 public health achievements

- *Examples*
  - Vaccination
  - Motor-vehicle safety
  - Safer workplaces
  - Fluoridation of drinking water
  - Recognition of tobacco use as a health hazard
- Each of these advances involved policy

Centers for Disease Control and Prevention. Ten great public health achievements--United States, 1900-1999. MMWR 1999 Apr 2;48(12):241-3

How well do research and PA policy connect?

The problem



Because what you told me is absolutely

eless

Yes, how did you know?

Ye

You mus

policy m

Because you don't know where you are, you don't know where you're going, and now you're blaming me

A Few Challenges

<u>For the policy maker</u>:

1. Poor timing
2. Lack of relevant data

<u>For the researcher</u>:

1. Mismatch of randomized thinking with nonrandom problems
2. Lack of control over the independent variable

Brownson et. al. Researchers and policy makers: travelers in parallel universes. *Am J Prev Med* 2006

What is funded…

Purtle *et al. Implementation Science* (2016) 11:1
DOI 10.1186/s13012-015-0367-1

Implementation Science

RESEARCH Open Access

A review of policy dissemination and implementation research funded by the National Institutes of Health, 2007–2014

Jonathan Purtle[1*], Rachel Peters[1] and Ross C. Brownson[2]

Study Purpose

Content Analysis to:

- Determine the extent to which policy D&I research has been funded by NIH between 2007-2014
- Identify trends in NIH-funded policy D&I
- Describe the characteristics of NIH-funded policy D&I projects

Results

- 12 (8.2%) of projects funded through D&I FOAs were classified as policy D&I
- $16,177,250 was awarded for these projects, 10.5% of all funding through D&I FOAs
- Annual policy D&I funding increased by 98.9% between 2007-2014
- The National Cancer Institute (NCI) supported 6 of the 12 policy D&I research projects

Considerations

- Policy dissemination research is important and needs more science
- Designs and methods differ from much of NIH-supported research
- Worth distinguishing “small p” from “Big P”
- Likely some variation by institute/center

A few words on designing for dissemination…

(mainly from a national survey; 266 US researchers)

Definition

- Designing for dissemination (D4D)
  - The process of ensuring that evidence-based interventions are developed in ways that match well with adopters' needs, assets, and time frames.
    - Might apply to any actionable finding or packaging/deigning interventions (RTIPs, post hoc)
- Focus of this portion is on D4D, not dissemination *research*
  - But D4D should inform your research

How well are we doing in D4D?

- Responses = 266
- Response rate = 48%*
- Median completion time = 11 minutes

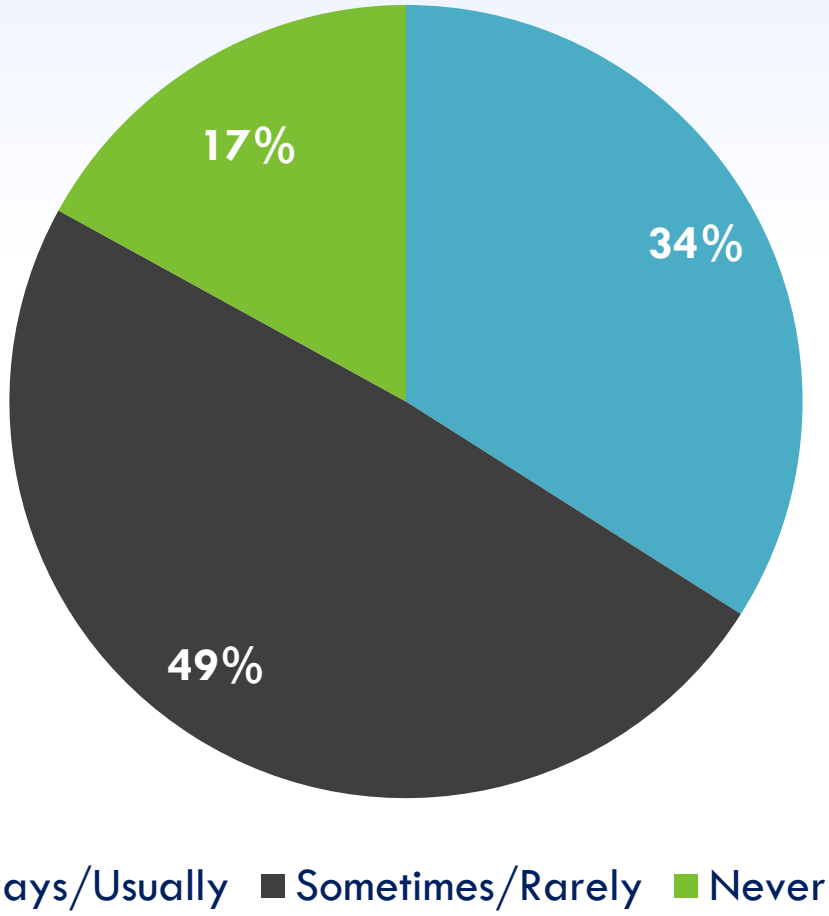
	n	%
University	172	65%
- affiliated with CDC PRC	*63*	
- no affil. with CDC PRC	*109*	
NIH	25	9%
CDC	34	13%
Other	34	13%
	266	100%

Brownson et al. Designing for Dissemination Among Public Health Researchers: Findings From a national survey in the United States. *Am J Public Health* July 18, 2013

Involving Stakeholders

Survey question:

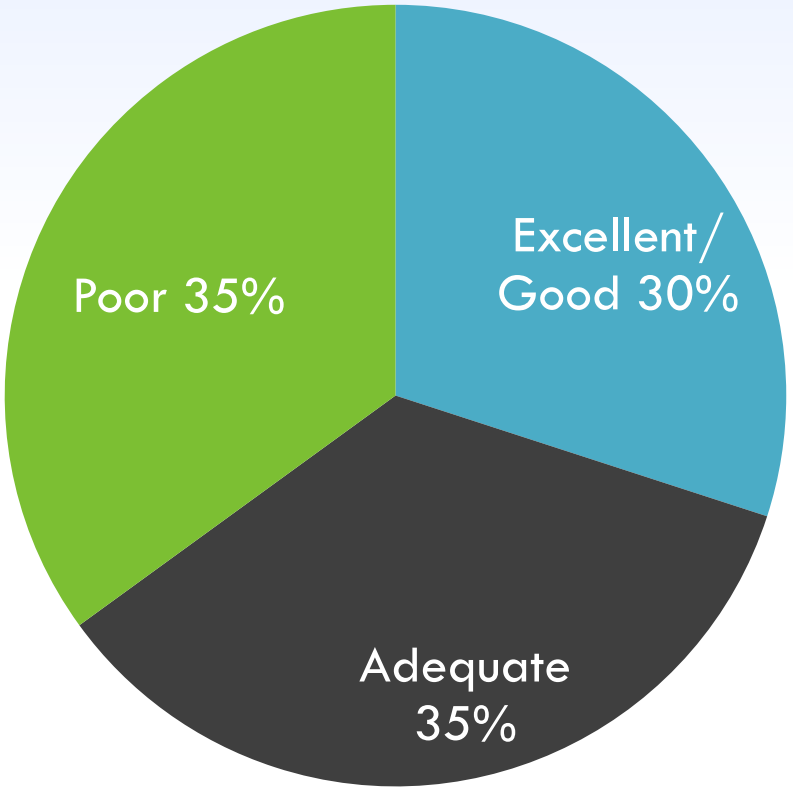
- As a part of your research process, how often do you involve stakeholders?



Rate Efforts

Survey question:

- Overall, how do you rate your efforts to disseminate your research findings to non-research audiences?



Multivariate predictors of excellent dissemination

- Important for their department
  - OR=2.3; 95% CI=1.2-4.5
- Expected by funder
  - OR=2.1; 95% CI=1.3-3.2
- Worked in policy/practice setting
  - OR=4.4; 95% CI=2.1-9.3
- NIH least effective among settings

Tabak RG, et al. What predicts dissemination efforts among public health researchers in the United States? *Public Health Rep.* Jul 2014;129(4):361-368

Example of the disconnect

How local public health agencies learn about research findings?	How researchers perceive they most effectively reach practitioners?
1. Professional associations	1. Journal articles
2. Seminars/workshops	2. Face-to-face meetings
3. Email alerts	3. Media interviews
4. Journal articles	4. Press releases

Improving D4D: Start early!!

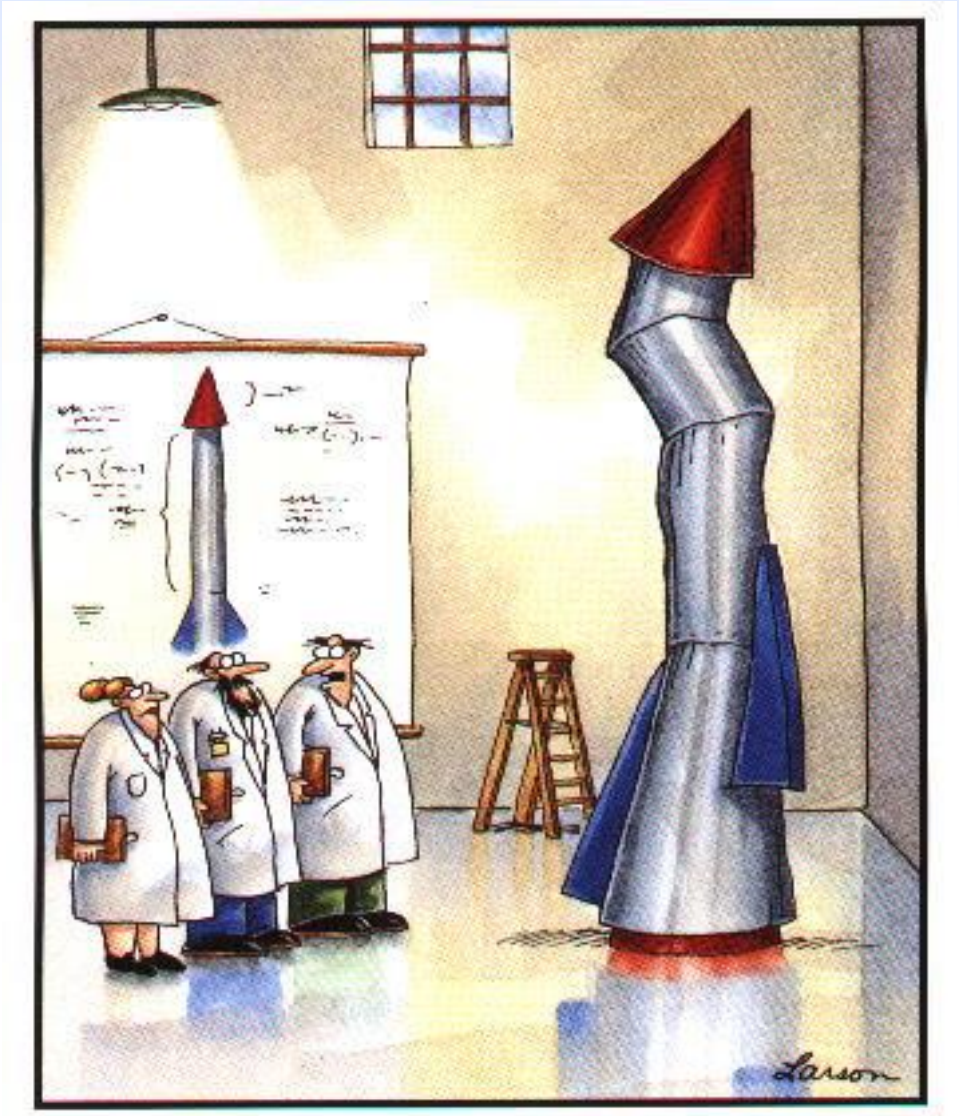
- Think about dissemination at the beginning of a research project
  - Structures
    - In a grant applications, are D4D principles embedded or a separate aim?
    - Do you have a conceptual model?
  - Processes
    - How to engage stakeholders early and often?
  - Products
    - How to frame messages, develop brief summaries?
  - Systems changes
    - How to shift funder, academic priorities/incentives?

Make better use of models/frameworks

- Outlined in Tabak *et al*., proliferation of models: 61 reviewed!!
  - ♦ Context is critical
    - ♦ Focus on external validity
  - ♦ Begin with stakeholders—take their perspective
  - ♦ Need balance between fidelity to EB program and adaptation to local setting
  - ♦ Unlikely to need to create a new model

Tabak RG, et al. Bridging research and practice: models for dissemination and implementation research. *Am J Prev Med.* Sep 2012;43(3):337-350

Know what you don't know…



"It's time we face reality, my friends. ...
We're not exactly rocket scientists."


THE LATEST RESEARCH SHOWS THAT WE REALLY SHOULD DO SOMETHING WITH ALL THIS RESEARCH

THANKS to David Chambers, Maria Fernandez, Bridget Gaglio, Christine Hunter, Jonathan Lomas, Borsika, Rabin, Cindy Vinson!!

Take home points

1. Dissemination research is a vibrant field with many practical applications.
2. There is a close nexus between dissemination research and research dissemination.
3. Following several key principles will improve dissemination research and D4D.

Implementation Science

Amy M. Kilbourne, PhD, MPH

Director, VA Quality Enhancement Research Initiative (QUERI)
Acting Director, VA Health Services Research and Development
Professor of Psychiatry, University of Michigan

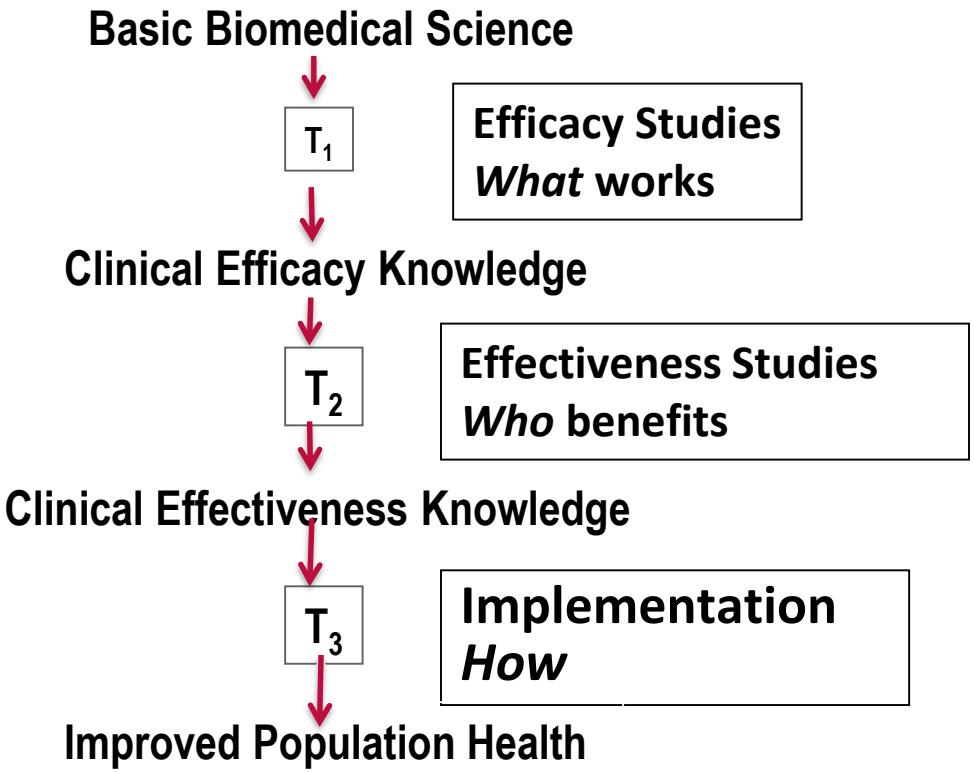
Research to Practice

Last Scene from Raiders of the Lost Ark

Healthcare is Changing

- Big Data, e-Health/m-Health
- Consumer-driven Healthcare reform
  - Exchanges/ACOs
  - Medicaid expansion
- ***Learning Healthcare Systems***
  - Aligning science with clinical priority goals
  - Conducting more rapid and efficient studies
  - Leveraging existing data to deploy and evaluate innovations and best practices

Implementation and the 3T's Road Map



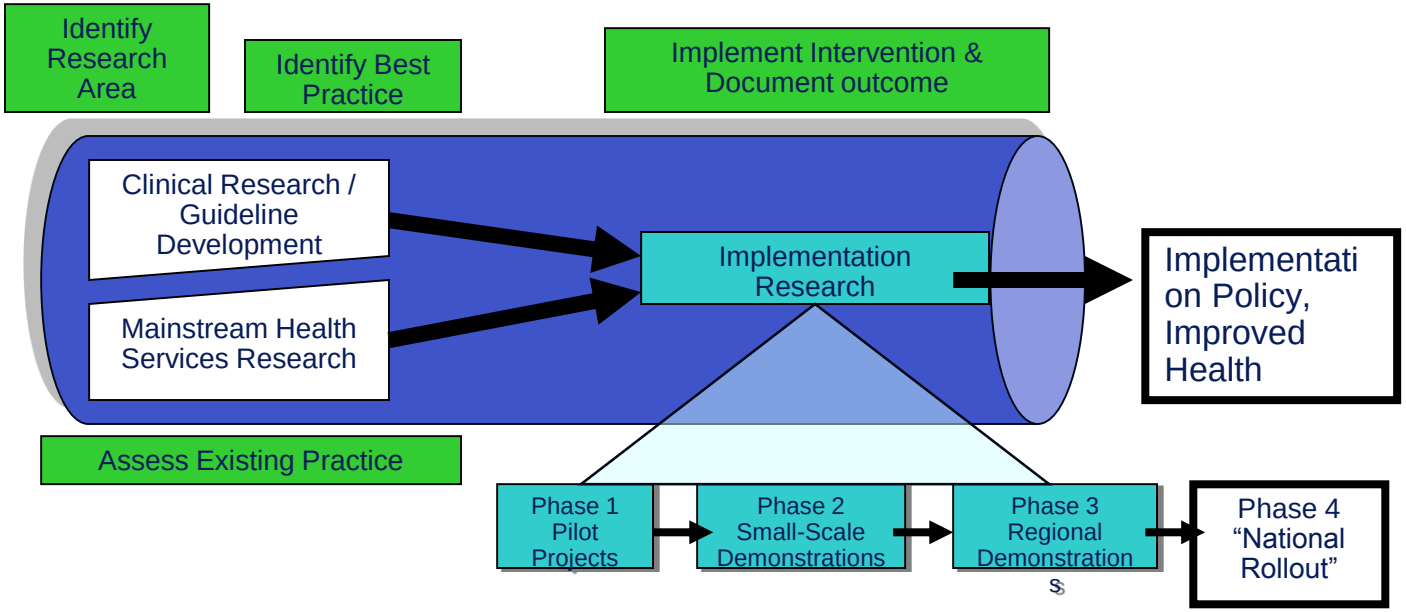
Modified from Dougherty and Conway, JAMA 2008;299:2319-2321

The Long Road to Learning Healthcare Systems (and why we need implementation)

- New research takes **too long** to get adopted
- Research is often **not aligned** to address critical health/health care problems
- Providers lack **tools/technical assistance** to implement effective treatments (data not enough)
- Large programs being rolled out without **adequate planning** to maximize effectiveness and learning
- **Variation** and patient-centered care
  - Treatments work differently for different people
  - But inefficiency is a problem

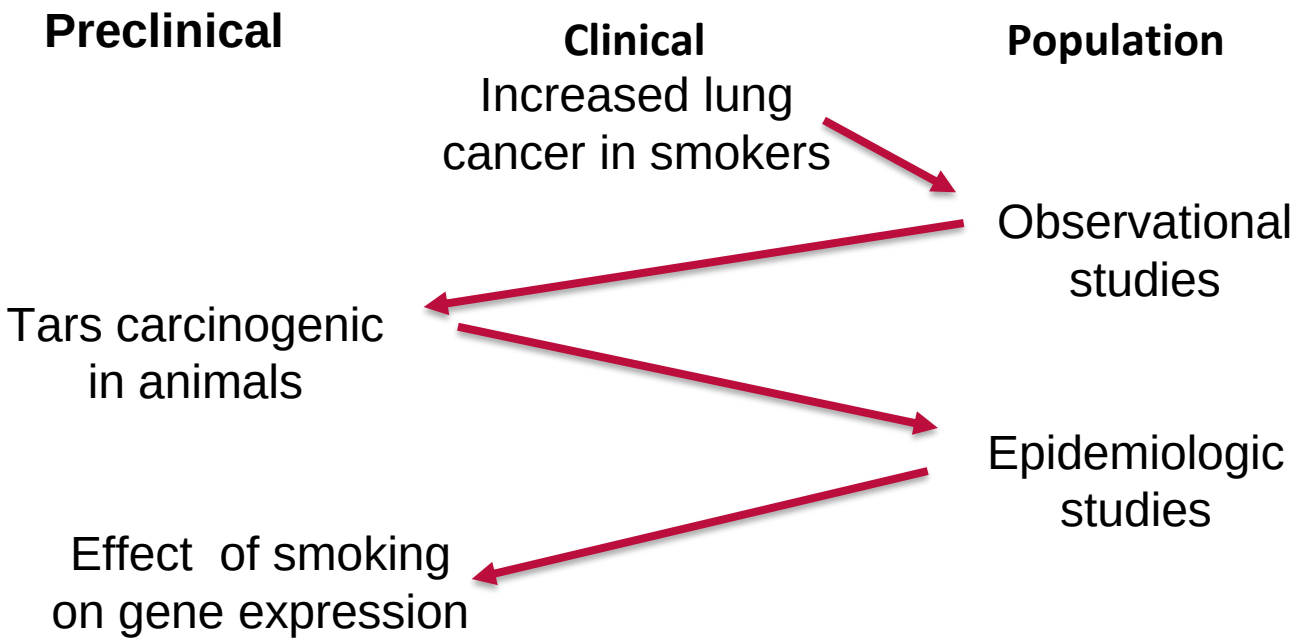
Implementation as a “Linear Process”

First Generation QUERI Implementation Pipeline



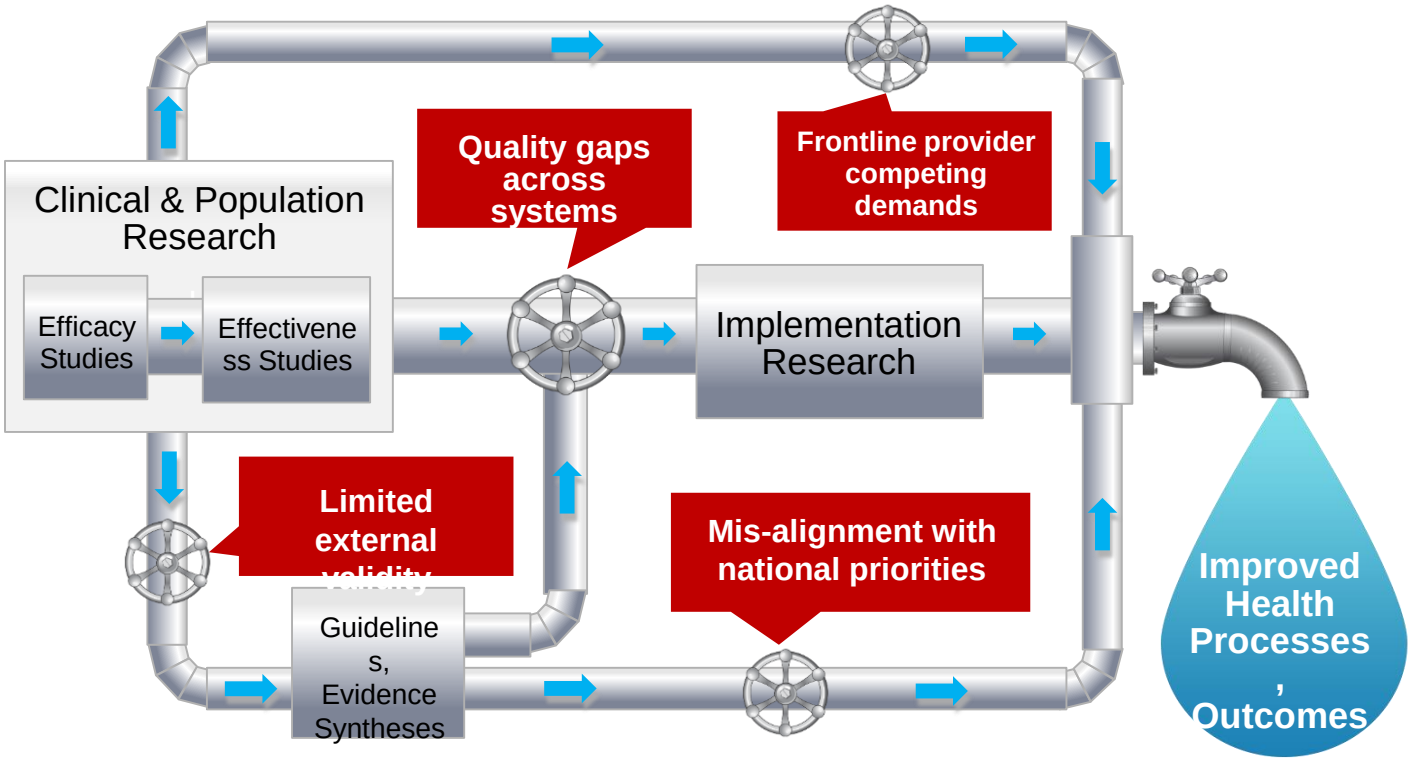
Beyond the Pipeline:

Dissemination & Implementation May Follow an Iterative Research Process

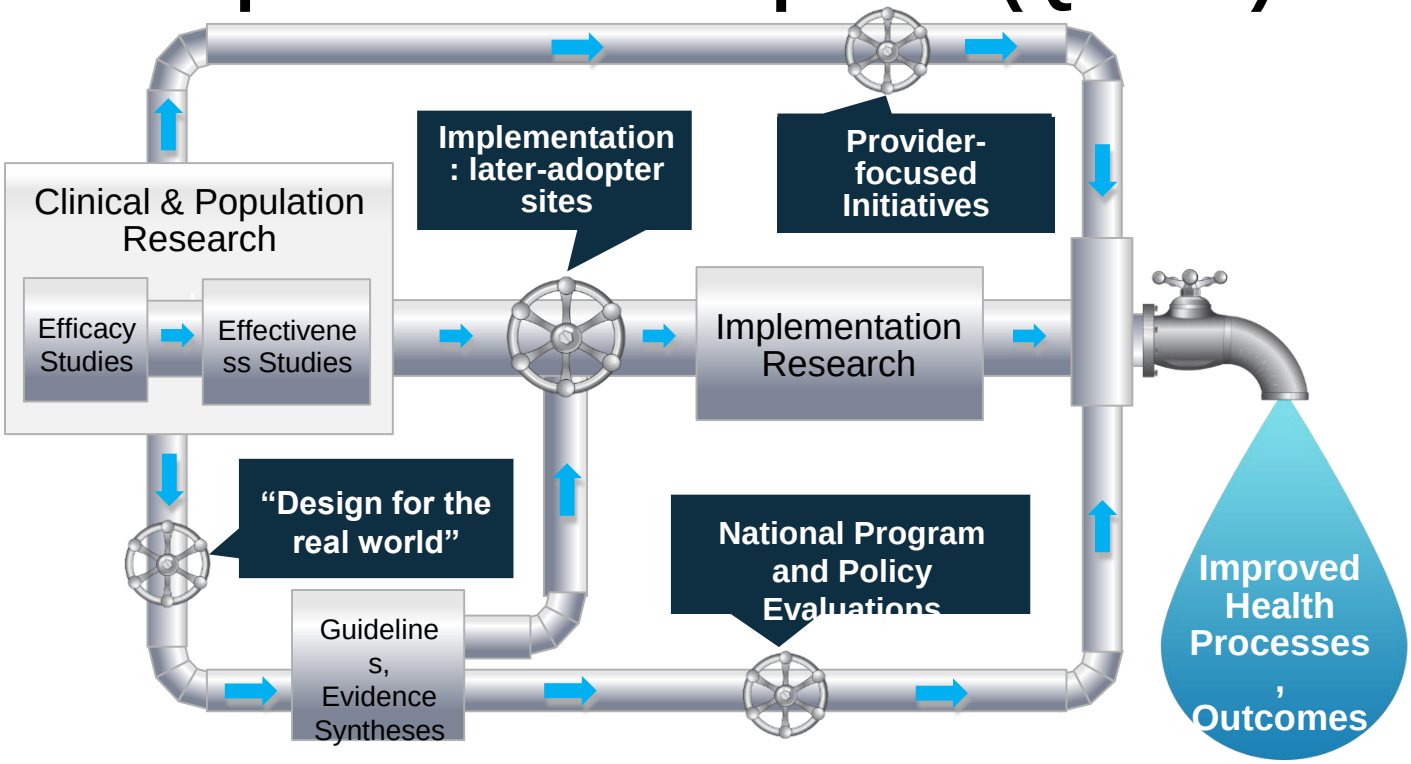


Modified from Rutter M: Psychological Medicine 2009 39,529-42

Second-Generation Implementation Pipeline (QUERI)



Second-Generation Implementation Pipeline (QUERI)



Implementation Science

"The scientific study of methods to promote the systematic uptake of research findings and other EBPs into routine practice, and, hence, to improve the quality and effectiveness of health services" (Eccles & Mittman, 2006)

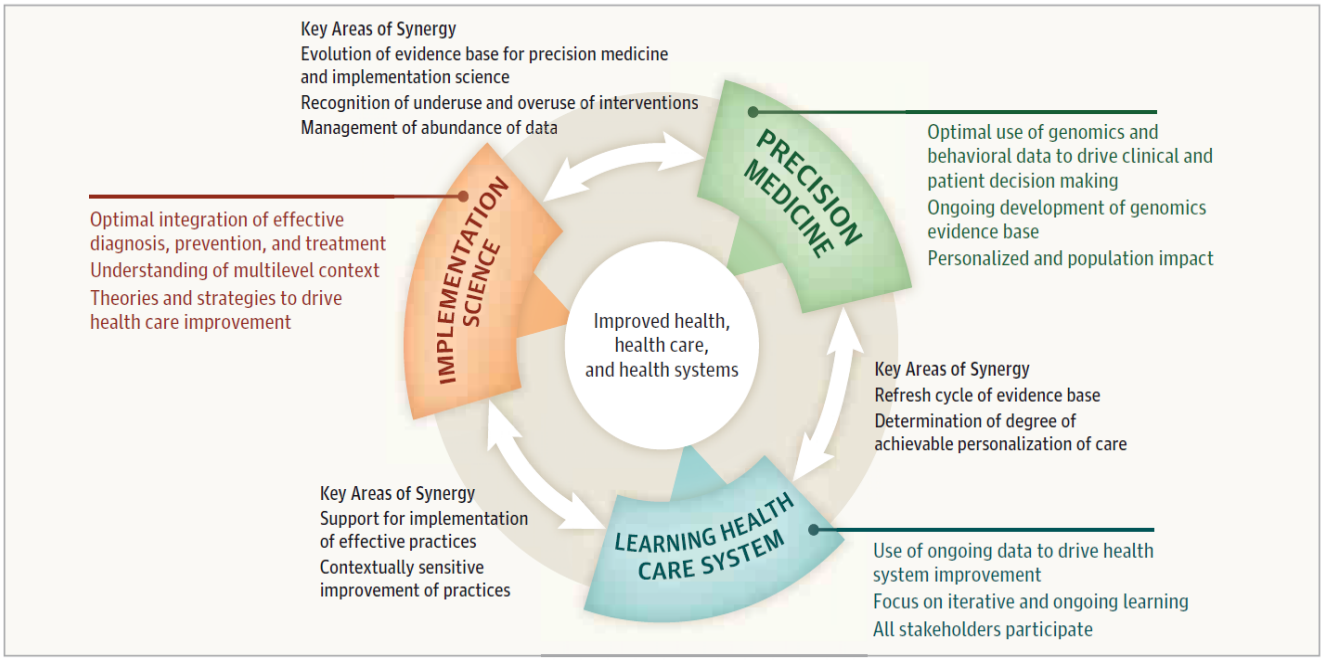
Synonyms include:

Knowledge Translation

Technology Transfer

Conversion of Implementation Science, Precision Medicine, & Learning Health Care System

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

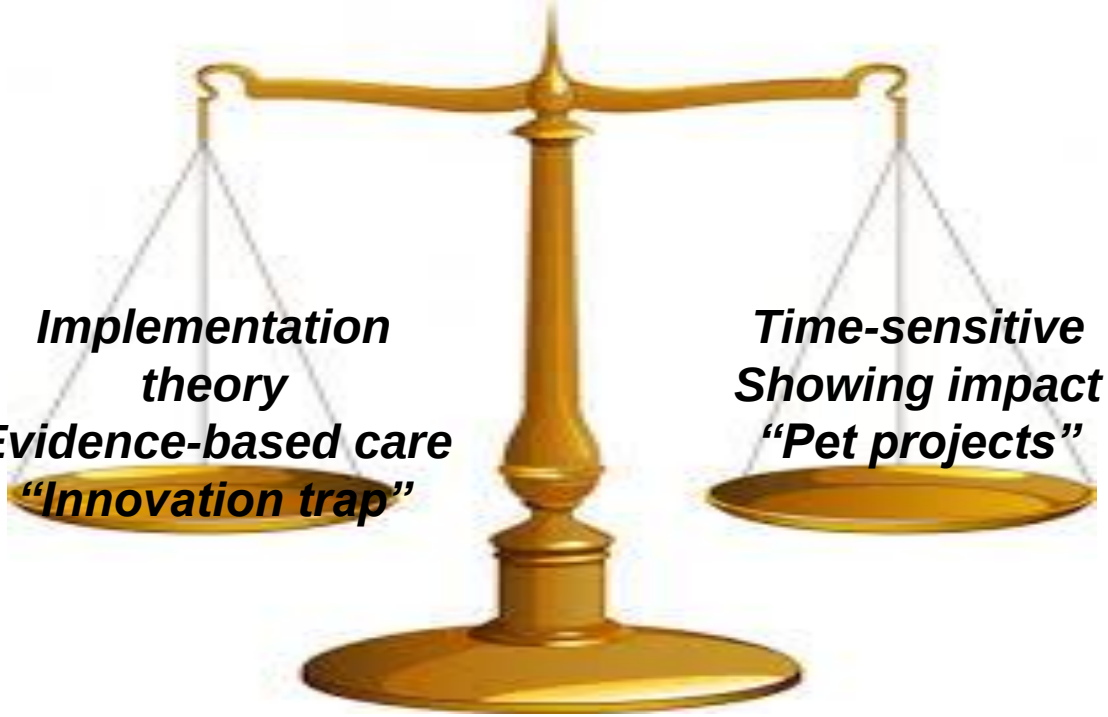


Chambers DA, Feero WG, Khoury MJ. Conversion of Implementation Science, Precision Medicine, and the Learning Health Care System, JAMA 2016

Why Implementation Science?

- *Journal publishing insufficient*
- *Relationships are important*
- *Health systems continuously adapting*
- *Top-down AND bottom-up strategies*

Implementation Involves Managing Partnerships



Implementation Theory

May C. Towards a general theory of implementation. Imp. Sci. 2013

"A deliberately initiated ***process***, in which **agents** intend to bring into operation new or modified **practices** that are institutionally sanctioned, and are performed by themselves and other agents"

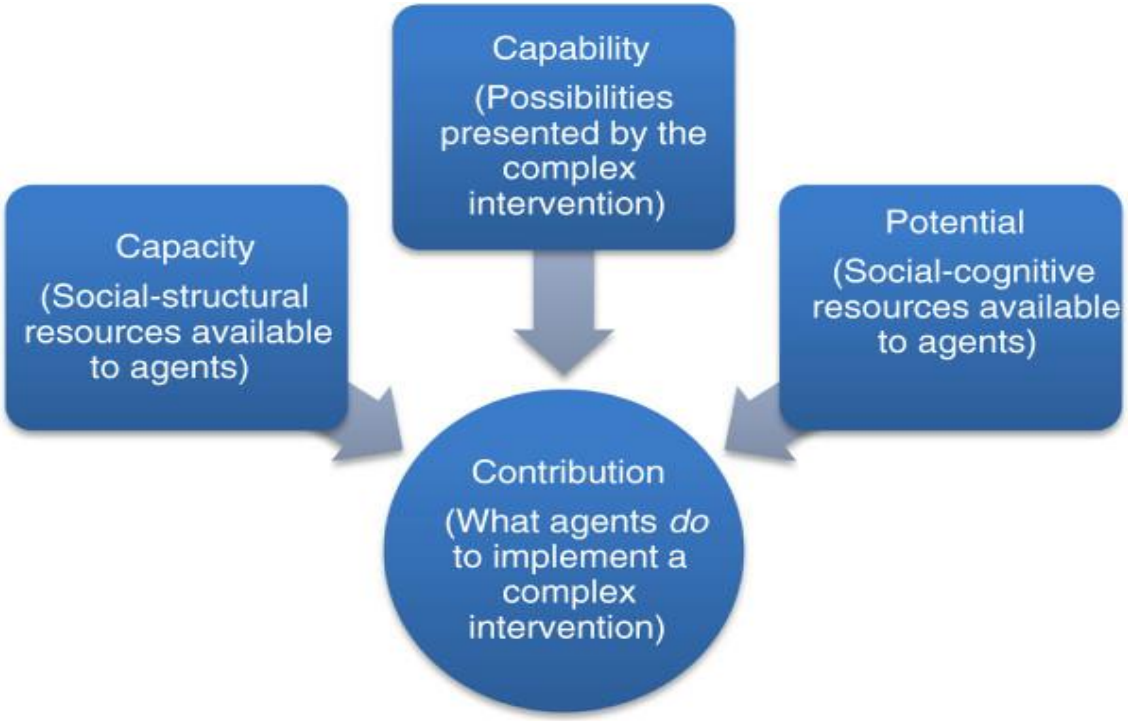
Key terms:

Process

Agents

Institutionally sanctioned practices

General Theory of Implementation



May C. Towards a general theory of implementation. Implement Sci. 2013

What Influences Implementation?

Domain	Factors/
Capacity	Organizational resources . . . ?
Capability	Program characteristics . . . ?
Potential	Provider, recipient factors . . . ?
Contribution	Day-to-day operations . . . ?

May C. Towards a general theory of implementation. Implement Sci. 2013

Applying Theory: Choosing Implementation Frameworks

"Theories inform the (frameworks) that provide the under girding or infrastructure, much like the frame of a house."

- **Explanatory: *how* implementation activities will affect a desired change**
- **Process: *what* implementation strategies should be planned**

Sales A, Smith JL, Curran G, Kochevar L. Models, strategies and tools: The role of theory in implementing evidence-based findings into health care practice. JGIM 2006; 21:S43-49.

Some Implementation Frameworks

- Explanatory
  - Consolidated Framework for Implementation Research (CFIR)
  - Theoretical Domains Framework (TDF)
  - Greenhalgh Implementation Processes Model

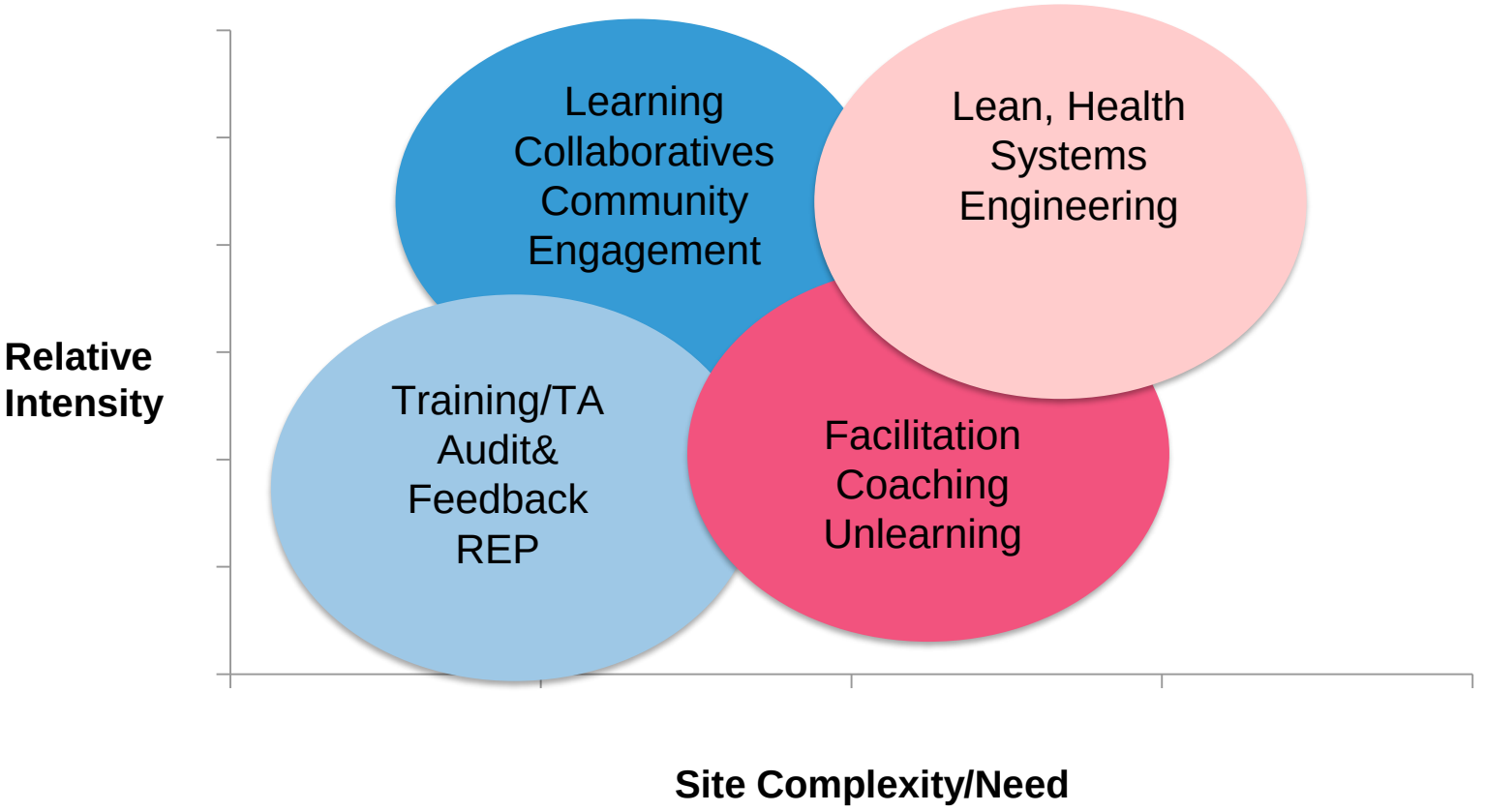
- Directive/applied
  - Reach Effectiveness Adoption Implementation Maintenance (RE-AIM)
  - Evidence-based Quality Improvement
  - Blended Facilitation
  - Replicating Effective Programs (REP/Enhanced REP)
  - Getting to Outcomes

Frameworks Inform Implementation Strategies

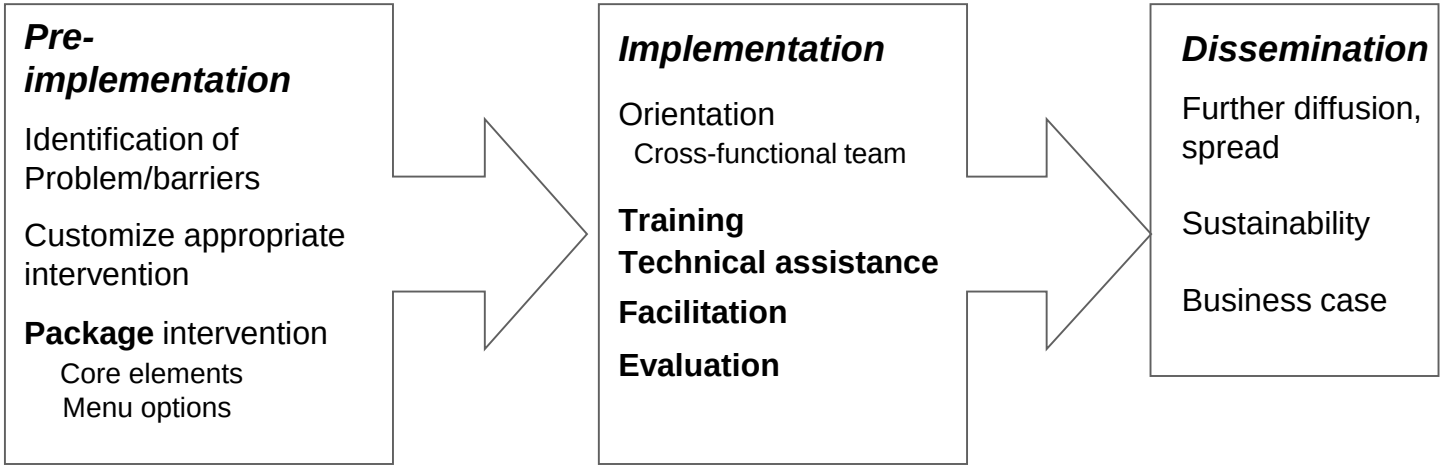
Highly-specified, systematic processes used to implement treatments/practices, often at the clinic or provider level, into usual care settings

- Address barriers, facilitators to adoption
- Buy-in from providers, organizations
- Should be tested across effective practices/programs

Examples of Implementation Strategies



Example: Enhanced Replicating Effective Programs (REP) Framework



REP was developed by the Centers for Disease Control to rapidly translate HIV prevention programs to community-based settings

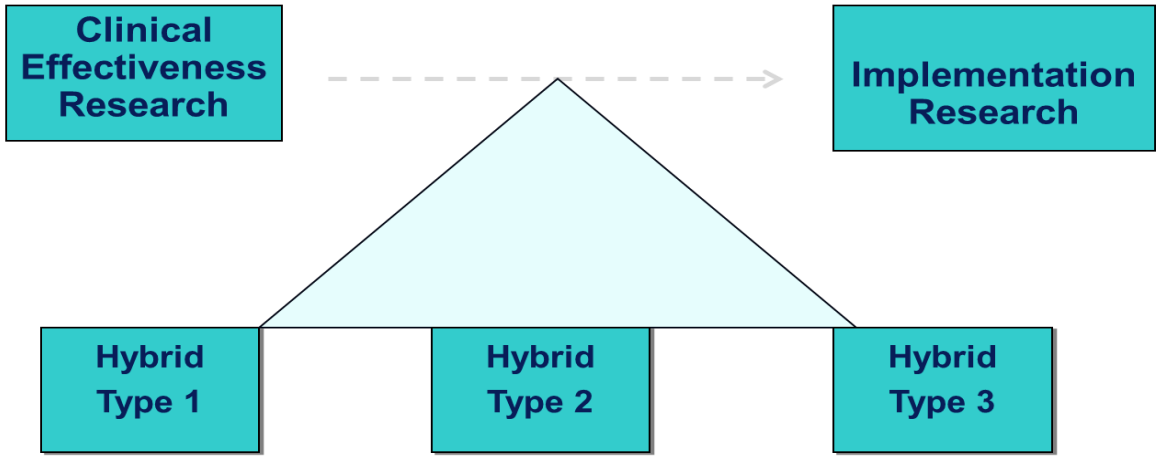
Enhanced REP includes additional facilitation based on the PARiHS framework: developing relationships and promoting provider self-efficacy

Hybrid Effectiveness/ Implementation Designs

- Testing implementation strategies
- Address limits of step-wise research (speed research → practice)
- Promote external validity
- Blend effectiveness, implementation stages

Curran, et. al. ***Effectiveness-Implementation Hybrid Designs. Med Care 2012***

Types of Hybrid Designs



Hybrid Type 1: test clinical intervention, observe/gather information on implementation

Hybrid Type 2: test clinical intervention, test implementation strategy

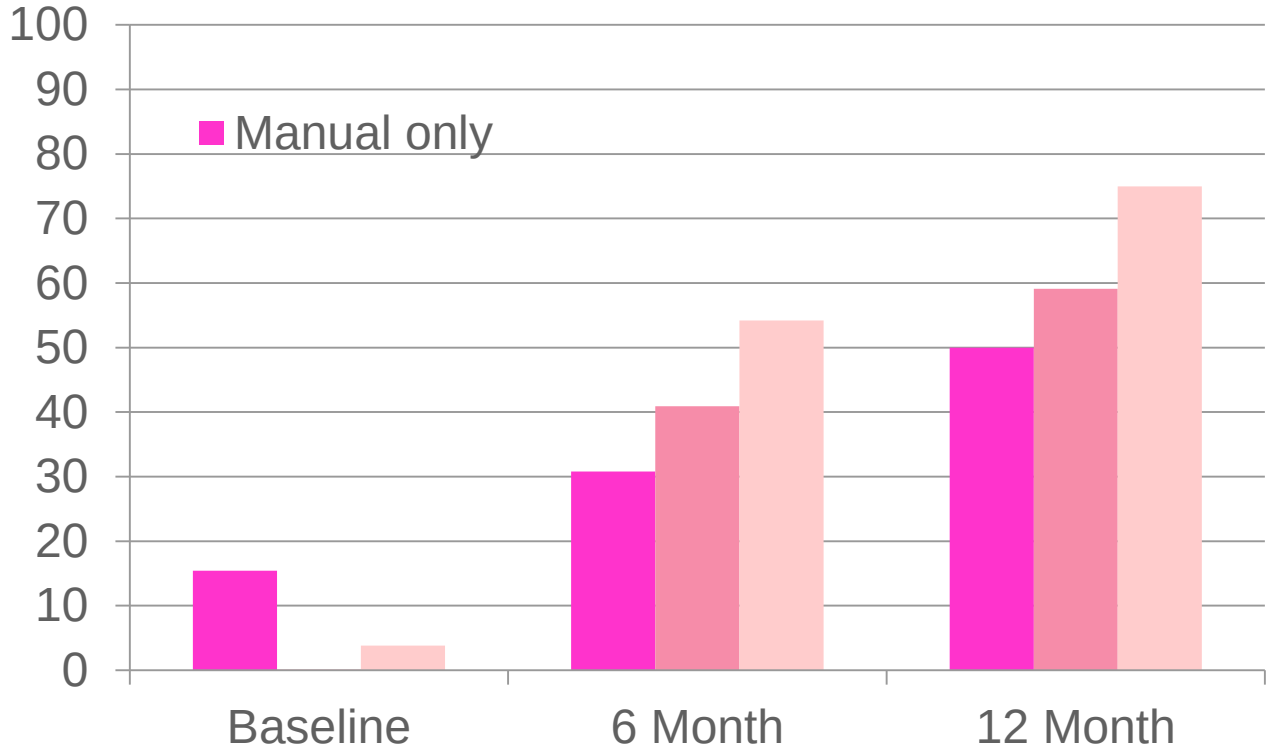
Hybrid Type 3: test implementation strategy, observe/gather information on clinical intervention outcomes

Hybrid Effectiveness/ Implementation Designs

	Type I	Type II	Type III
Design Characteristic	Test clinical intervention	Test both clinical & implementation strategies	Test implementation strategy
Question	Is treatment effective versus usual care (UC)?	Is treatment delivered through tailored provider education effective vs UC?	Does tailored (vs. standard) provider education improve treatment use?
Unit of analyses	Patient	Providers/clinics	Providers/clinics
Primary outcomes	Health outcomes	Process measures	Uptake

Curran, et. al. ***Effectiveness-Implementation Hybrid Designs. Med Care 2012***

Hybrid Type III: REP and Uptake of HIV Prevention Interventions in AIDS Service Organizations



Kelly J, et al. AJPH 2000

Take Home Points

- “Nothing is more practical than a good theory”
- Partner or perish
  - Understanding what your stakeholders need AND
  - The lay of the land: barriers, facilitators to translation
  - Expect to jump on moving trains
- Go beyond assessing barriers/facilitators
- Mix **top-down** and **bottom-up efforts**
  - **Centralized** and **locally driven** approaches
  - Plan a good design

Thank you for your attention.

Please return to the Wikispace for assigned readings and Assignment 1 questions for response.