



# Research to Reality: The Evidence Integration Triangle

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# Outline

- Need for Implementation Research
- What Do We Know About Dissemination & Implementation (D&I) Science?
- How to Make Sense out of this Complexity?
  - The Evidence Integration Triangle (EIT)
- How to Learn More- and GET FUNDED?
- Future Directions and Opportunities to Get Involved

# Translation Continuum



Bench



Bedside



Clinic



Community



Population  
& Policy



# Bench to Bookshelf



# Current Situation in United States<sup>1</sup>

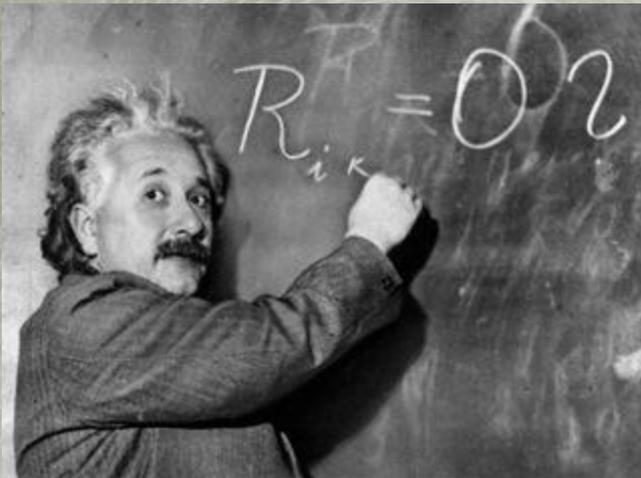
- Underperforming health care system<sup>2</sup>
- Balkanized and silo approaches
- Expensive, unsustainable cost, increasing
- Inequitable: Health disparities
- **CRISIS and OPPORTUNITY**

<sup>1</sup>Institute of Medicine. Unequal treatment...Washington D.C., National Academies Press, 2003

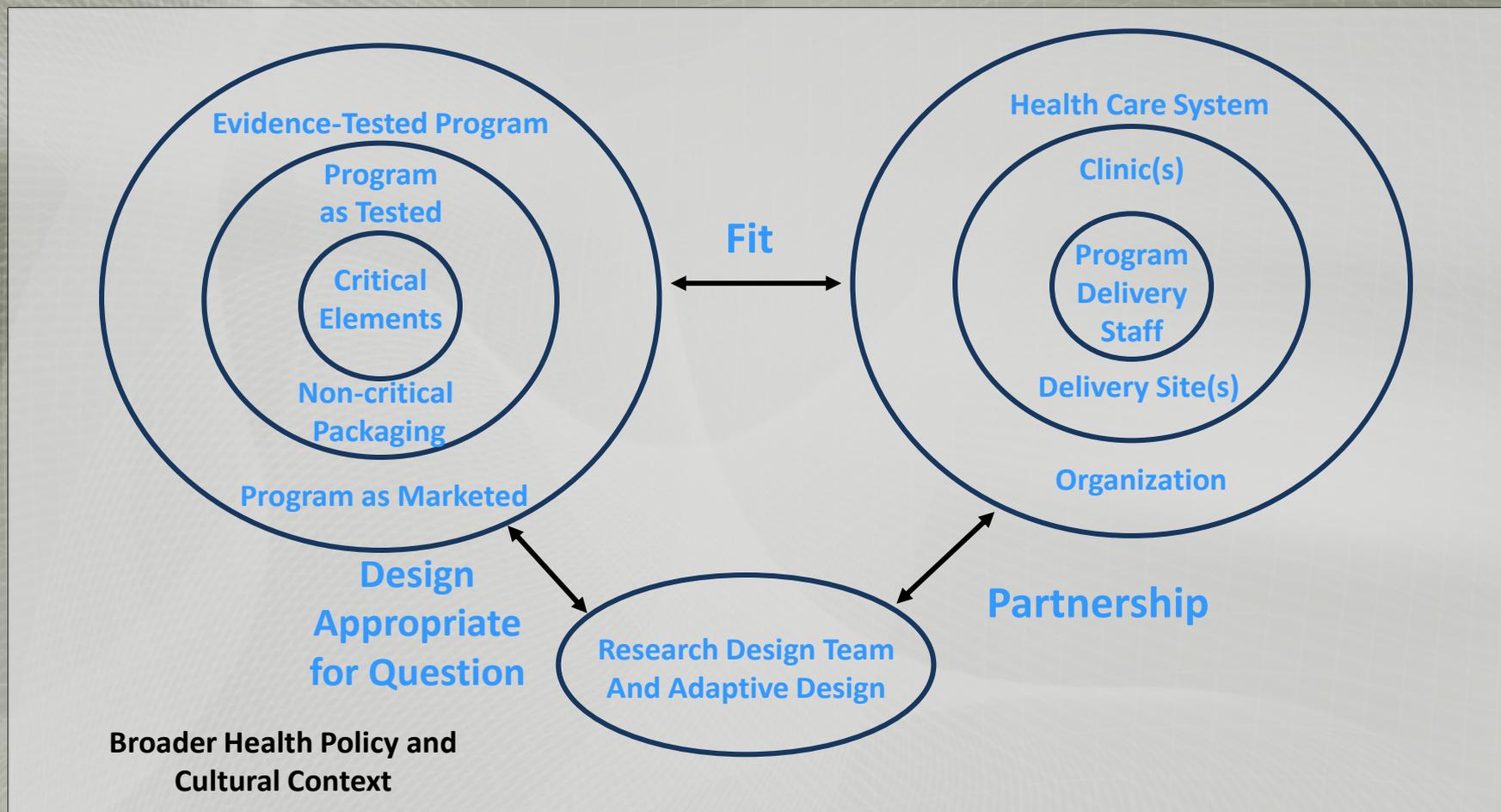
<sup>2</sup>McGlynn EA et al. The quality of health care...*N Eng J Med* 2003;348(26):2635-2645

*“The significant problems we face cannot be solved by the same level of thinking that created them.”*

**A. Einstein**



# Integrated Dynamic, Multilevel Research-Practice Partnerships Systems Approach



# Implementation and Dissemination Research Characteristics (Russ' view)

- Contextual
- Complex
- Multi-component programs and policies
- Non-linear
- Transdisciplinary
- Multi-level

Glasgow R & Steiner J. (2011). In Dissemination and Implementation Research. Brownson, R, Colditz, G, and Proctor, E (Eds.). Oxford.

# Rapid Learning Approaches

## Data Collected:

- With real (and complex) patients
- By real-world staff
- Under real-world conditions and settings
- And evaluated through real-time data (often with Electronic Health Records)

# Recommended Purpose of Research (ala RE-AIM)

## Collect evidence to document interventions that can:

- **Reach** large numbers of people, especially those who can most benefit
- Be widely **adopted** by different settings
- Be consistently **implemented** by staff members with moderate levels of training and expertise
- Produce **replicable** and **long-lasting** effects (and minimal negative impacts) at reasonable **cost**

# Ultimate Impact of an Insurance-sponsored Weight Management Program in West Virginia<sup>1</sup>

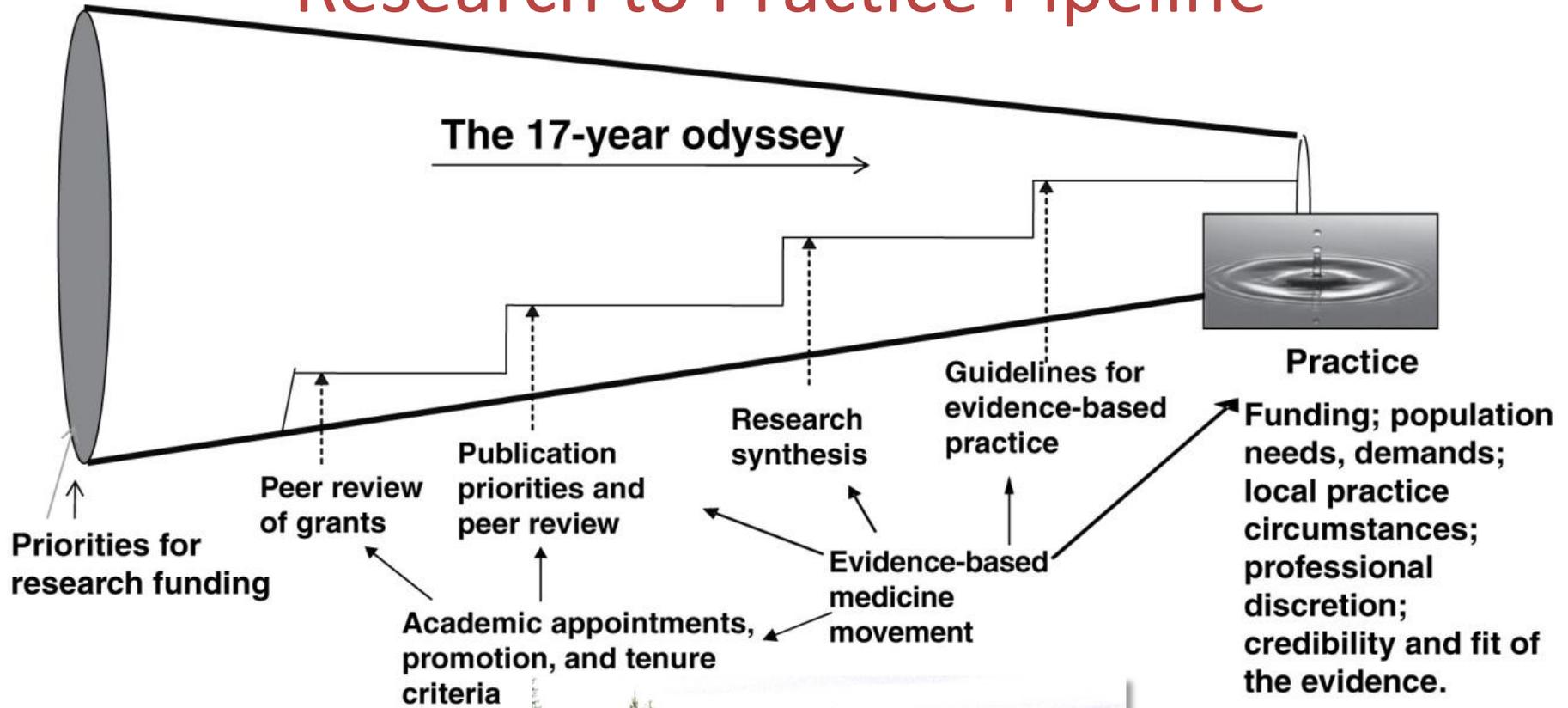
Dissemination Step	Concept	% Impacted
8.8% of Weight Management sites participated	Adoption	8.80%
5.9% of members participated	Reach	0.52%
91.4% program components implemented	Implementation	0.47%
<b>43.8% of participants showed weight loss</b>	<b>Effectiveness</b>	<b>0.21%</b>
21.2% individuals maintained benefit (individual)	Maintenance	0.04%



<sup>1</sup>Abildso CG, Zizzi SJ, Reger-Nash B. Evaluating an Insurance-Sponsored Weight Management Program With the RE-AIM Model, West Virginia, 2004-2008. Preventing Chronic Disease Public Health Research, Practice, and Policy. 2010. 7(3).

STEP	TRANSLATION ISSUES INVOLVED	LENGTH OF TIME
Initial Research	Choice of measures; generalizability.	1-5 years
Replication Research	Degree measures harmonized, samples similar study(ies).	1-3 years
Synthesis Reviews	Criteria used for: inclusion, quality, outcomes, realist review?	1-2 years?
Guideline Created	Implementation guides? Adaptation guides, feasibility.	1-3 years?
Other Guidelines?	Consistency with original, costs and ease of implementation.	1-2 years?
Adoption of Guidelines	Politics, costs, adaptation.	6 months?
Implementation of Guidelines	Readiness, capacity, incentives, tracking, guidelines.	3-12 months
Patient "Adherence"	Competing demands, cost, meaning.	1 – X months
Sustainability	Evolution over time, "drift."	2 - ? years
<b>Complete Cascade</b>	<b>Partnership, relevance, adaptation are cross-cutting issues.</b>	<b>8-17+ years</b>

# Research to Practice Pipeline



Green, LW et al. 2009. Annual Rev. Public Health. 30: 151-174

## Intervention Program/Policy

*(Prevention or Treatment)*

(e.g. design; key components; principles;  
external validity)

Evidence

Stakeholders

### Multi-Level Context

- Intrapersonal/Biological
- Interpersonal
- Organizational
- Policy
- Community/Economic
- Social/Environment

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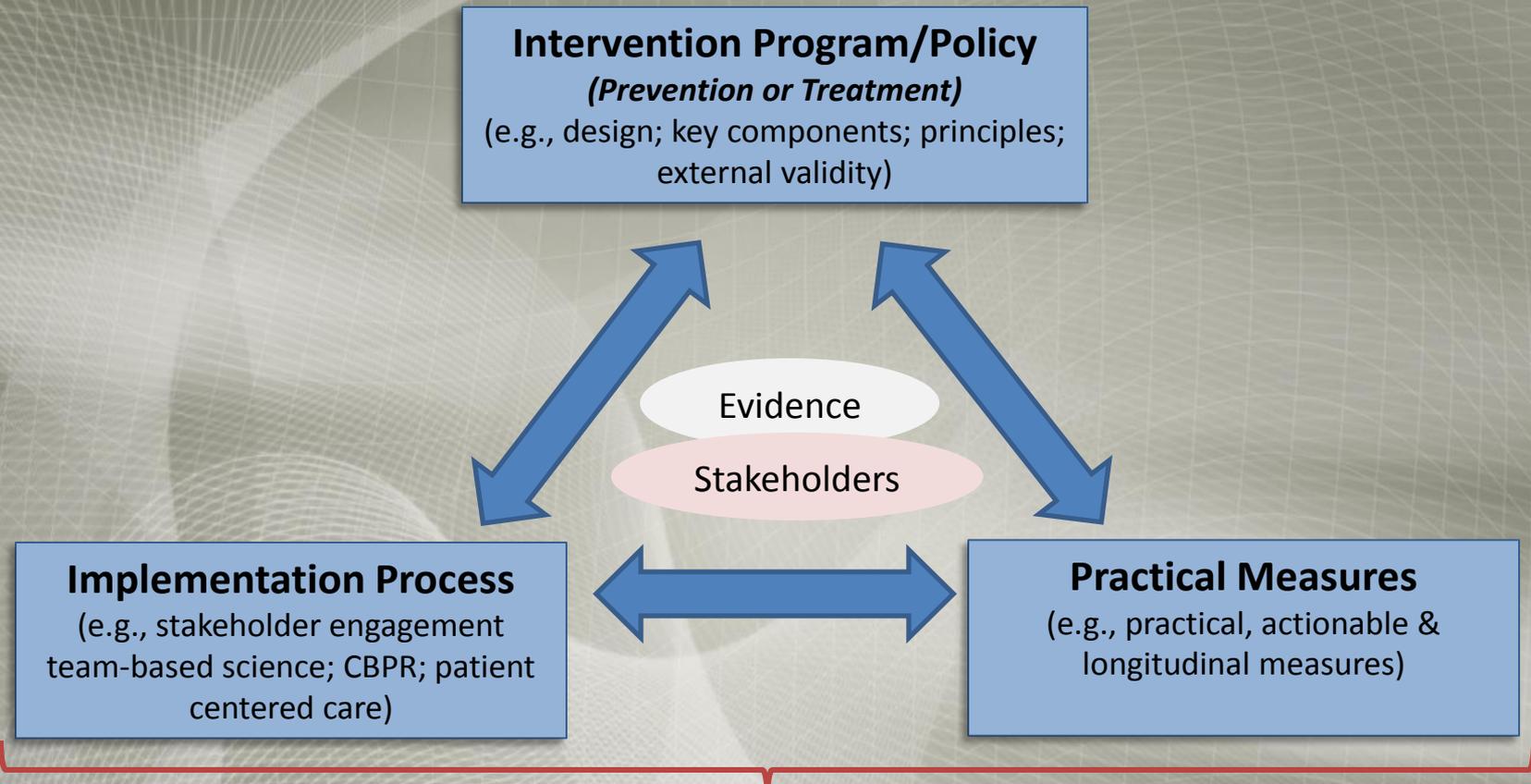
Stakeholders

**Practical Measures**

(e.g. actionable & longitudinal  
measures)

**Multi-Level Context**

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### Multi-Level Context

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## Intervention Program/Policy – The “What”

- Identify key components or theoretical principles
- Need for detailed implementation guides, lessons learned manuals
- Need to focus and report on both internal and external validity (need to add relevance to rigor)
- Most focus on treatment; less on prevention; least on policy

***“If we want more evidence-based practice, we need more practice-based evidence.”***

## Practical Measures – the “So What”

### Measures need to be:

- Brief and practical
- Collected longitudinally to assess progress
- Reliable and valid
- Sensitive to change
- Have national norms, easily understood and ACTIONABLE
- Culturally appropriate across groups
- Reflect multiple stakeholder perspectives



Society of Behavioral Medicine Health Policy Statement on Public Health Need for Patient Reported Measures. [http://www.sbm.org/policy/patient-reported\\_measures.pdf](http://www.sbm.org/policy/patient-reported_measures.pdf)

# Implementation Process – The “How”

- Partnership and Community Based Participatory Research (CBPR) approaches<sup>1</sup>
- Patient-centered Care Approach
- Team science in action<sup>2,3</sup>
- Iterative, self-correcting

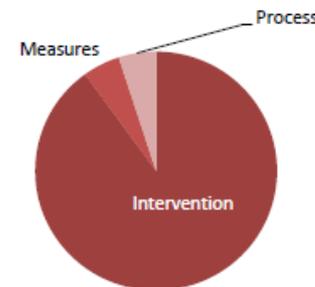
<sup>1</sup> Guidelines and Categories for Classifying Participatory Research Projects in Health:  
<http://lgreen.net/guidelines.html>

<sup>2</sup> Gray, D. O. (2008). In C. L. S. Coryn & M. Scriven (Eds.), *Reforming the evaluation of research. New Directions for Evaluation*, 118, 73–87.

<sup>3</sup> Mâsse, LC, et al. *Am J Prev Med*. 2008; 35 (2S): S151-S160.

# CURRENT IDEAL

## Current Research Focus of Evidence-based Practice



**Intervention Program/Policy**  
(*Prevention or Treatment*)  
(e.g., design; key components; principles; external validity)

Evidence

Stakeholders

**Implementation Process**

(e.g., stakeholder engagement; team-based science; CBPR; patient centered care)

**Practical Measures**

(e.g., actionable & longitudinal measures)

## Multi-Level Context

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### Intervention Program/Policy

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(e.g., stakeholder engagement; team-based science; CBPR; patient centered care)

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# Practical (Pragmatic) Trials: Key Contextual Characteristics

- Multiple, heterogeneous settings
- Representative populations
- Comparison conditions are real-world alternatives
- Multiple outcomes important to decision and policy makers

Thorpe KE et al., *Can Med Assoc J*, 2009, 180: E47-57

Tunis SR et al. Practical clinical trials...*JAMA* 2003;290:1624-1632

Glasgow RE et al. Practical clinical trials...*Med Care*2005;43(6):551-557

*“For every complex problem  
there is a simple solution ...  
and it is wrong.”*

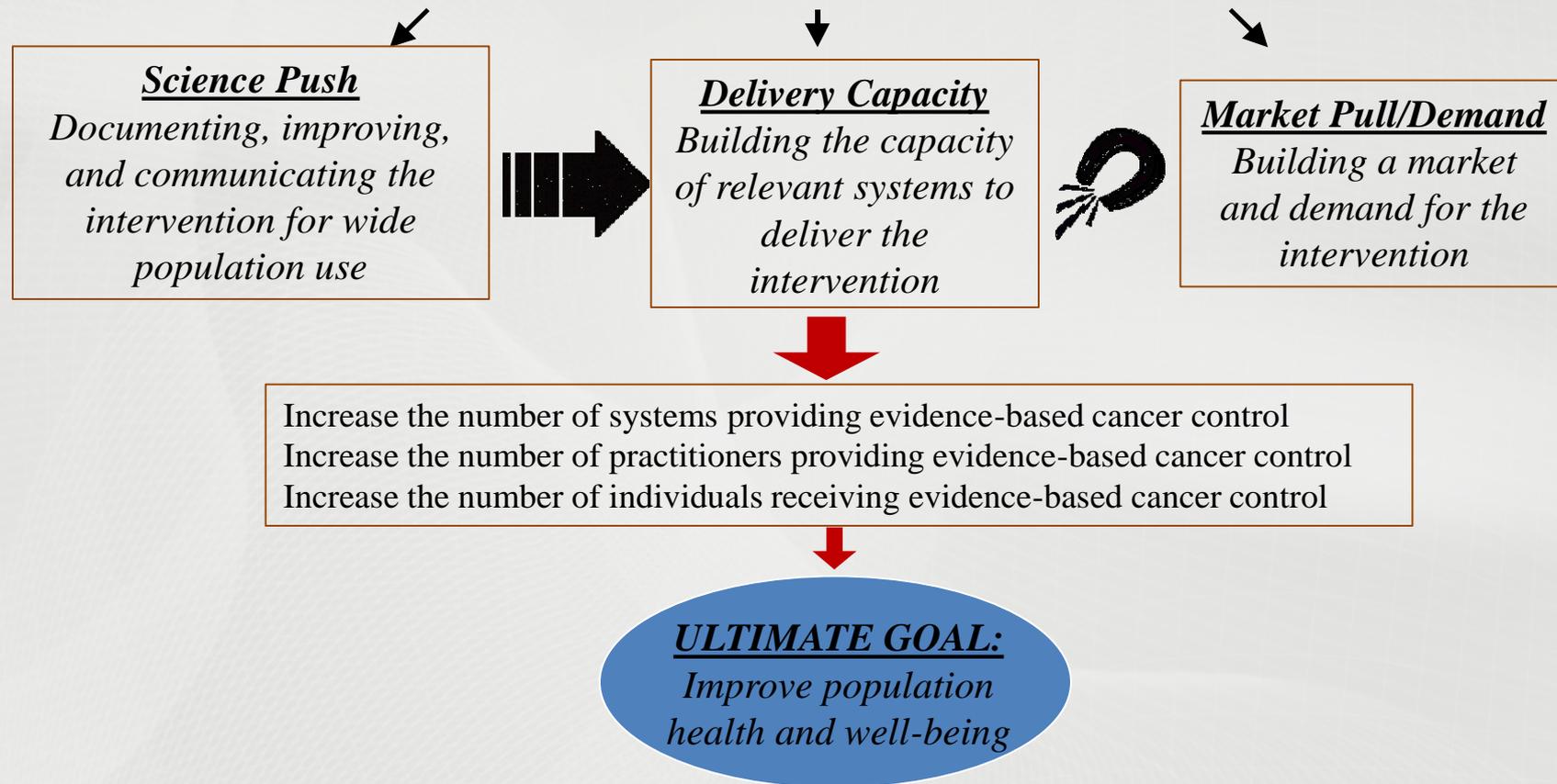


***H.L. Mencken***

# Bridging the Gap: A Synergistic Model

Getting Evidence-based Cancer Control Interventions into Practice

**GOAL:** To increase the adoption, reach and impact of evidence-based cancer control

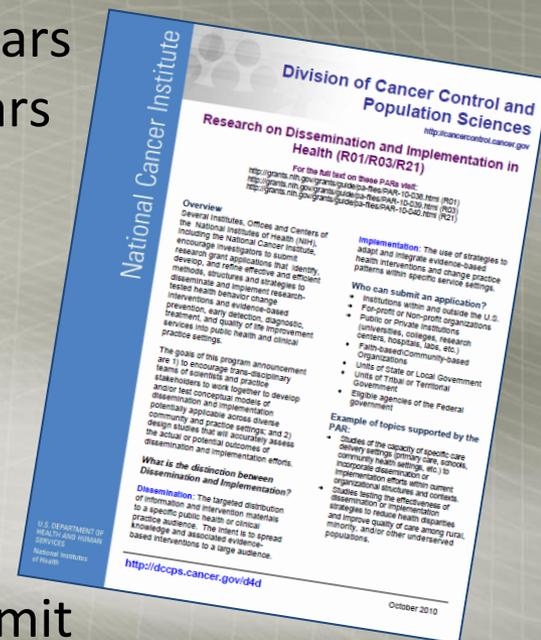




*"By God, gentlemen, I believe we've found it—the Fountain of Funding!"*

# The Major Cross-NIH D&I Funding Announcement

- R01 - PAR 10-038 (\$500k per annum up to five years)
- R03 - PAR 10-039 (\$50K per annum up to two years)
- R21 - PAR 10-040 (\$275K up to two years)
- Participating Institutes: NIMH, NCI, NIDA, NIAAA, NIAID\*, NHLBI, NINR, NIDDK\*, NINDS\*, NIDCD, NIDCR, & Office of Behavioral & Social Sciences Research
- Starting October 2010, new standing review commit
- Dissemination and Implementation Health Research
- Three submission dates per year: **February, June, October**



\* New Participating Institutes

# Key Features

- “To identify, ... and refine effective and efficient methods....
- ..... and strategies to disseminate and implement research-tested ...
- .... interventions and .... prevention... and Quality of Life improvement services.....
- in public health and clinical practice settings”

# Other D & I Mechanisms

- CTSA funding at many medical schools
- Partnerships with Prevention Research Centers
- Some CDC Mechanisms
- AHRQ Funding- especially via PBRNs and EHR Related
- Other NIH and private funding (ACS, etc.)

# Key Content Issues Funded

- Implementation of evidence-based interventions in healthcare and community settings
- Workplace health promotion
- Survey of state (provincial) tobacco plans and implementation research to reach and assist underserved populations

# Key Questions Asked By Reviewers

- Is this program or policy ready for dissemination?
- Is team really transdisciplinary?
- Will this advance the field; how is it innovative?
- Is there a good plan for sustainability or broader dissemination of the project?

## Content Issues Seldom Addressed (Research Opportunities)

- Comparative Effectiveness Research
- Dissemination to large number of settings
- Proposals addressing complex patients, complex and multilevel problems
- Health policy issues
- Dissemination & implementation of systematic review evidence

# Annual D&I Meetings

- “State of the D&I Science” Venue
- Three meetings held since 2007
  - Participation increased from 350 registrants in 2007 to over 900 in 2010
  - Past themes have included: “Building Capacity” and “Methods and Measures”

**Next meeting: Bethesda, MD March 21-22, 2011**

**Theme: Policy and International Contributions**

Registration: <http://conferences.thehillgroup.com/obssr/DI2011/index.html>

# PREDICTING THE FUTURE...



**“You Don’t Need a Weatherman  
To Know Which Way the Wind Blows”  
-Bob Dylan**

# Evolving Issues

- Simulations, MODELING, system dynamic models
- Time-lagged REPLICATIONS
- Natural experiments
- Well-documented quality improvement studies
- RAPID LEARNING and electronic medical records (EHR) databases<sup>1</sup>
- Practical and pragmatic trials<sup>2</sup>

<sup>1</sup>Etheredge LM, Health Affairs, 2007, Web Exclusive Collection: w107-118

<sup>2</sup>Thorpe KE et al., Can Med Assoc J, 2009, 180: E47-57

# Challenges and Conclusions

- The future is **multiple** (conditions, behaviors, interactive modalities)
- The future is **complex** (and we ignore complexity at our peril)<sup>1</sup>
- **“All models (and designs) are wrong”**<sup>2</sup>— and greater tolerance, respect, and creativity is needed
- We need to **UN-learn** much of what we have been taught to answer the tough questions

<sup>1</sup>Glasgow RE, Emmons KM. *Annual Review of Public Health* Dec 6,2006 epub ahead of print

<sup>2</sup>StermanJD. *Syst Dynam Rev* 2002;18:501-531

# Evidence that...

**IS MORE**



**IS LESS**

Contextual

Isolated

Practical, efficient

Abstract, intensive

Robust, generalizable

Singular (setting, staff, population)

Comparative

Academic

Comprehensive

Single outcome

Representative

From ideal settings



# COMMENTS, QUESTIONS, ETC.

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NCI Implementation Science Website:

<http://cancercontrol.cancer.gov/d4d/>

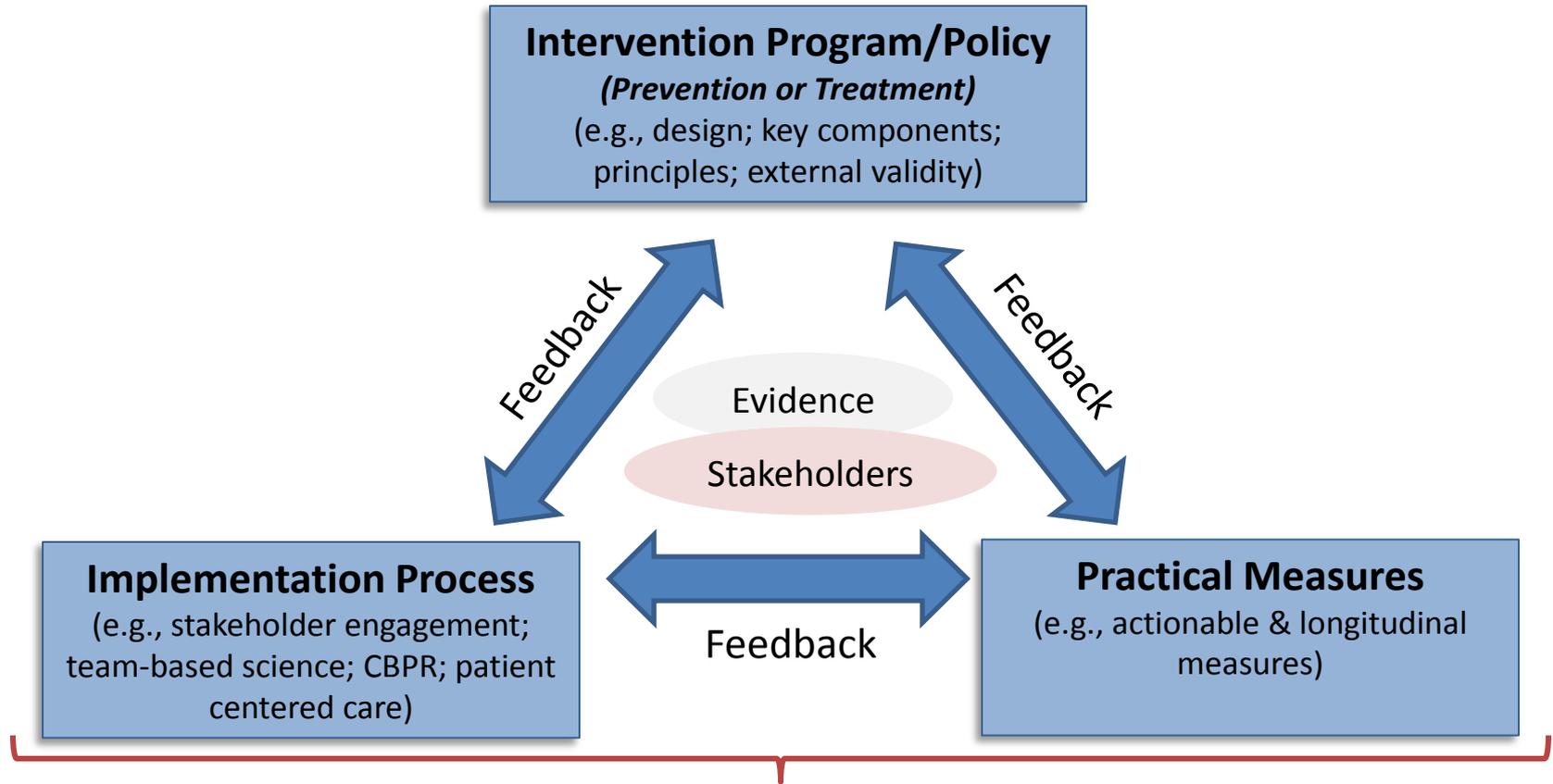


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INSTITUTE

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# Evidence Integration Triangle

## Translation Across the Continuum



### Multi-Level Context

- Intrapersonal/Biological
- Interpersonal
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# Key Pragmatic and Translation Content Issues in Need of Study by Research Design, Intervention and Evaluation Issues

Research Issue	Key T3-T4 Complex Issues in Need of Study			
	Practical and Feasible Interventions	Key Contextual Factors	Transparent Reporting	Design Fits Question
<b>Experimental Design</b>	<ul style="list-style-type: none"> <li>Addresses issues <u>relevant</u> to decision makers</li> <li>Representative settings and participants</li> <li>Includes <u>complex patients</u> and realistic comparison treatment(s)</li> </ul>	<ul style="list-style-type: none"> <li>Heterogeneous or typical settings</li> <li>Study of <u>moderating factors</u></li> <li>Includes qualitative features.</li> </ul>	Reports <ul style="list-style-type: none"> <li>Modification and adaptation to recruitment and design</li> <li>across sites</li> <li><u>local customization</u>.</li> </ul>	<ul style="list-style-type: none"> <li>Fits specific question               <ul style="list-style-type: none"> <li>Dynamic</li> <li>Adaptive</li> <li>Rapid and efficient</li> </ul> </li> <li>Information for scale-up and robustness analyses</li> <li>Simulations</li> </ul>
<b>Intervention Characteristics</b>	<ul style="list-style-type: none"> <li>Designed for <u>broad adoption and implementation</u></li> <li>Efficient</li> <li>MINC*</li> <li>Stepped care</li> <li><u>Scalable</u>.</li> </ul>	<ul style="list-style-type: none"> <li>Flexible</li> <li>Provides <u>guidelines</u> for fidelity and customization</li> <li>Deliverable by variety of staff in typical settings</li> </ul>	Reports on: <ul style="list-style-type: none"> <li><u>Adoption</u></li> <li>Implementation</li> <li><u>Modifications</u></li> <li>Subgroup effects</li> <li>“<u>CONSORT Plus</u>”*** information.</li> </ul>	<ul style="list-style-type: none"> <li>Designed for healthcare <u>settings of future</u></li> <li>QI blends that get smarter over time</li> <li><u>Sustainable</u> with typical resources.</li> </ul>
<b>Evaluation Measures and Analyses</b>	<ul style="list-style-type: none"> <li>Analyses of modifier and subgroup effects</li> <li>Effects of <u>Tx intensity</u> and staff expertise</li> <li><u>Cost, cost-effectiveness, and sensitivity analysis</u>.</li> </ul>	<ul style="list-style-type: none"> <li>Report policy, economic, and political context</li> <li>Assess impact on               <ul style="list-style-type: none"> <li><u>Disparities</u></li> <li>high-risk subgroups</li> <li><u>variation</u> across settings</li> <li>staff and time</li> </ul> </li> <li><u>Generalization analyses</u></li> </ul>	<ul style="list-style-type: none"> <li>Reach by               <ul style="list-style-type: none"> <li>Condition</li> <li>Unintended</li> <li>Quality- of-life impacts</li> </ul> </li> <li><u>Implementation</u> by condition and over time</li> <li><u>Maintenance</u> at setting and individual levels.</li> </ul>	<ul style="list-style-type: none"> <li>Evaluate systems impacts and unintended consequences</li> <li>Understand multi-level effects and mediators</li> <li>“Post-mortem” interviews</li> <li>long-term sustainability and program evaluation</li> </ul>

# WHY? (Targets for Change?)

- Much research not relevant to patients, practitioners, policy makers
- Vested interests (FDA model)
- Way we were trained – “unlearning”
- Complex, “wicked issues”<sup>1</sup>
- Insufficient funding (98.5% NIH budget for basic)

<sup>1</sup>Kreuter MW et al. Understanding wicked problems. *Health EducBehav*2004;Aug;31(4):441-454