



U.S. Department of Health and Human Services



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Dissemination and Implementation Research in Health: Translating Science to Practice

Presented By:

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Moderated By:

Gabriella Newes-Adeyi, PhD, MPH, Director
Practice-Based Research Network Resource Center

Sponsored by the AHRQ PBRN Resource Center

July 22, 2015



Agenda

- Welcome and introduction
- Presentations
- Q&A session with all presenters
- Instructions for obtaining your CME Certificate of Participation

Note: After today's webinar, a copy of the slides will be e-mailed to all webinar participants.



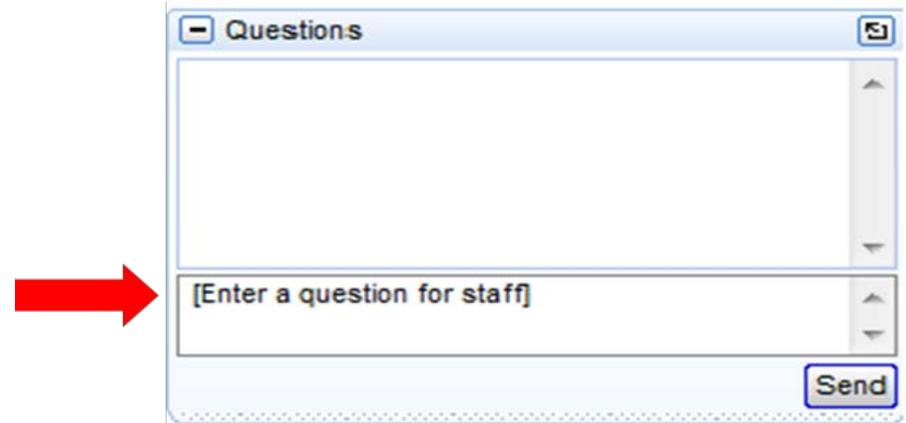
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Today's Presenters

Dissemination and Implementation Science: How do we fix the leaky pipeline?



Ross C. Brownson, PhD

Bernard Becker Professor of Public Health

Washington University in St. Louis



Today's Presenters

Opportunities: Dissemination & Implementation Science in the context of practice-based research



Graham A. Colditz, MD, DrPH

Niess-Gain Professor of Surgery, Associate Director of Prevention and Control,
Washington University School of Medicine, Siteman Cancer Center

Deputy Director, Institute for Public Health

***Dissemination and Implementation
Science: How do we fix the leaky
pipeline?***

**AHRQ's Practice-Based Research Network
Resource Center**

22 July 2015; Webinar

Ross C. Brownson and Graham A. Colditz

Washington University in St. Louis

“To him/her who devotes his life to science, nothing can give more happiness than increasing the number of discoveries, but his/her cup of joy is full when the results of his/her studies immediately find practical applications.”

-- **Louis Pasteur**

Goals for Today

1. Problem: Discovery to delivery gap
2. Solution: Dissemination & implementation science
3. Opportunities: New areas in practice-based research

***Houston...
we have a problem!!***



When do you know your issue
has arrived?

Appearance in the popular press



The image is a screenshot of a Newsweek website article. At the top left is the Newsweek logo. To its right is a navigation menu with categories: NATION · POLITICS · WORLD · BUSINESS/TECH · CULTURE · LIFE/HEALTH. Below the logo is a search bar with the text "Search" and a magnifying glass icon. Underneath the search bar is a row of links: SUBSCRIBE, LOGIN · REGISTER, BLOGS: THE GAGGLE · DECLASSIFIED · TECHTONIC SHIFTS · HUMAN CONDITION · MORE BLOGS ·. Below this is a promotional banner for Newsweek DRAMA with the text "Subscribe to Newsweek and save up to 88%" and a red button that says "CLICK HERE →". The article's category is "LIFE/HEALTH" with the sub-header "THE WAY WE LIVE AND WHY" and further sub-categories "HEALTH · LIFE · STYLE · HEALTH CARE". The article title is "ON SCIENCE | Sharon Begley Where Are the Cures?". The lead paragraph reads: "Scientists call the gulf between a biomedical discovery and new treatment 'the valley of death.'" Below the lead is the publication date "Published Nov 1, 2008" and a note "From the magazine issue dated Nov 10, 2008". At the bottom of the article area is a social sharing section with icons for Facebook, Digg, Tweet, LinkedIn, and a "Buzz up!" button. Below that are "Tools" for "28 Post Your Comment", "Print", and "Email".

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Newsweek

“Our bill saves lives.” Senate Democrats on health-care reform AP⁷

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ON SCIENCE | **Sharon Begley**

Where Are the Cures?

Scientists call the gulf between a biomedical discovery and new treatment 'the valley of death.'

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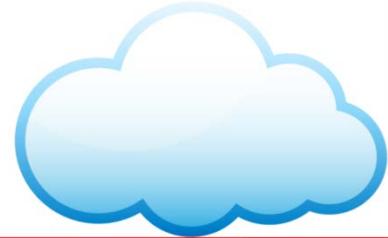
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THE LATEST RESEARCH SHOWS THAT
WE REALLY SHOULD DO SOMETHING
WITH ALL THIS RESEARCH



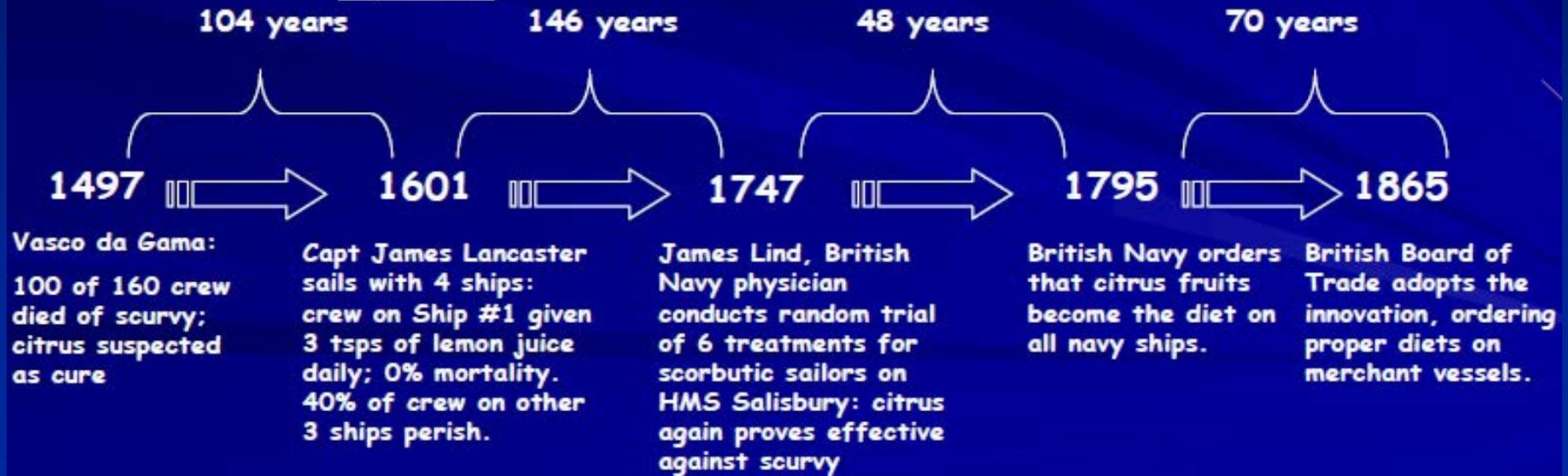
Most Common Type of Research? Bench to Bookshelf (to cloud)



The Gap: Scurvy

What progress have we made in getting evidence into practice?

Total elapsed time from Lancaster to adoption: 264 years



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

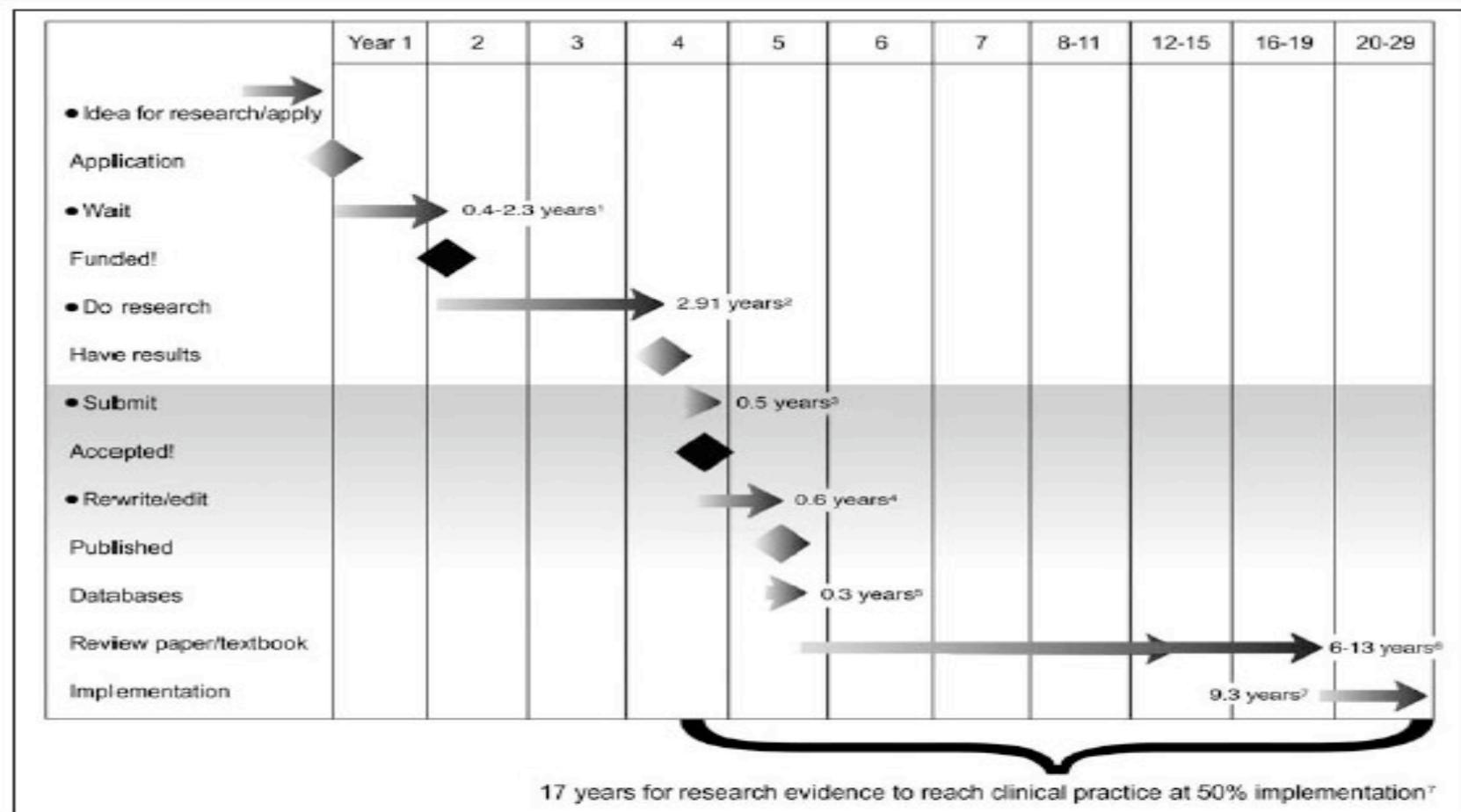


Figure 1. Timeline from idea to actionable knowledge.

¹ 0.4-2.3 years from the time of application for funding until receipt of award (NIAID tutorial:aaa.niaid.nih.gov/hcrv/grants/cycle/part01.htm#a).

² Average length of NCINHLBI trials is 2.91 years (Meinert CL, Tonascia S. Clinical trials: design, conduct, and analysis. New York, Oxford University Press, 1986:40).

^{3,4} Kumar PD. Publication lag intervals—a reason for authors' apathy? J Assoc Physicians India 1992 Sep;40(9):623-4.

⁵ Poyer RK. Time lag in four indexing services. Spec Lib 1982 Apr;73:142-6.

⁶ Antman EM, Lau J, Kupelnick B, Mosteller F, Chalmers TC. A comparison of results of meta-analyses of randomized control trials and recommendations of clinical experts. Treatments for myocardial infarction. JAMA 1992 Jul;268(2):240-8.

⁷ Balas ES, Boren SA. Managing clinical knowledge for health care improvement. Yearbook of Medical Informatics 2000: Patient-centered Systems. Stuttgart, Germany: Schattauer, 2000:65-70.

The promise of D&I research

...there is still an enormous gap between what we know can maximize the quality of health care and what is currently being delivered in practice and community settings.

...to optimize public health we must not only understand how to create the best interventions, but how to best ensure that they are effectively delivered within clinical and community practice.

NIH, OBSSR

THE DISCOVERY-DELIVERY CONTINUUM



How do we ensure transmission and adoption of evidence-based approaches across this continuum?

Definitions* - D&I research

- **Dissemination:** An active approach of spreading evidence-based interventions to the target audience via determined channels using planned strategies.
- **Implementation:** The process of putting to use or integrating evidence-based interventions within a specific setting.
- **Evidence-based intervention:** The objects of dissemination and implementation are interventions with proven efficacy and effectiveness.

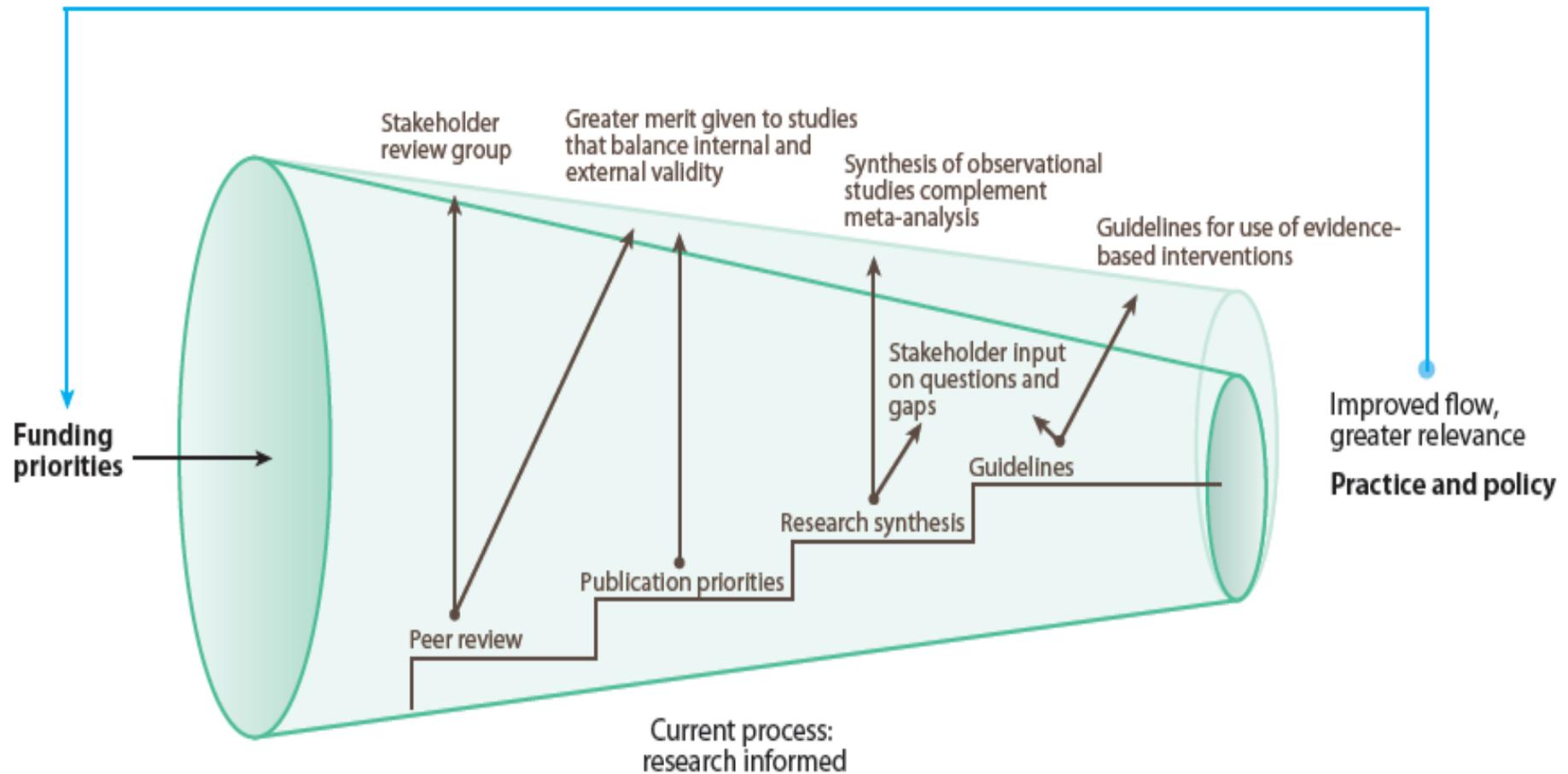
*Also see Rabin chapter/reading

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
Topic	All levels: primary, secondary, tertiary prevention	All levels: primary, secondary, tertiary prevention

Fix the leaky pipeline!!

Proposed process:
increase stakeholder input and reporting on external validity



D&I Research Topics (NIH)

- Analysis of factors influencing the creation, packaging, transmission and reception of valid health research knowledge
- Experimental studies to test the effectiveness of dissemination strategies, focusing on relevant outcomes (e.g., acquisition of new knowledge, use of knowledge in practice decision-making)
- Studies testing the utility of alternative dissemination strategies for service delivery systems targeting rural, minority, and/or other underserved populations
- Studies on how target audiences are defined, and how evidence is packaged for specific target audiences

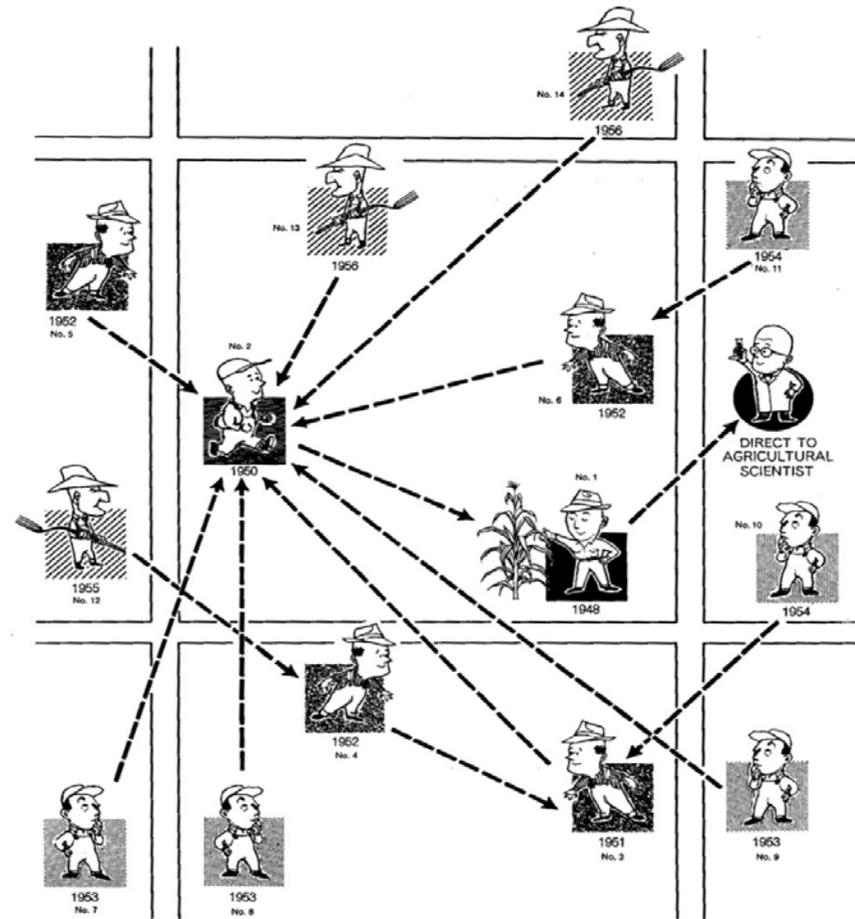
Think of a common
implementation problem in your
field...

Answer:

**Dissemination &
Implementation Science**

Historical context (abbreviated)

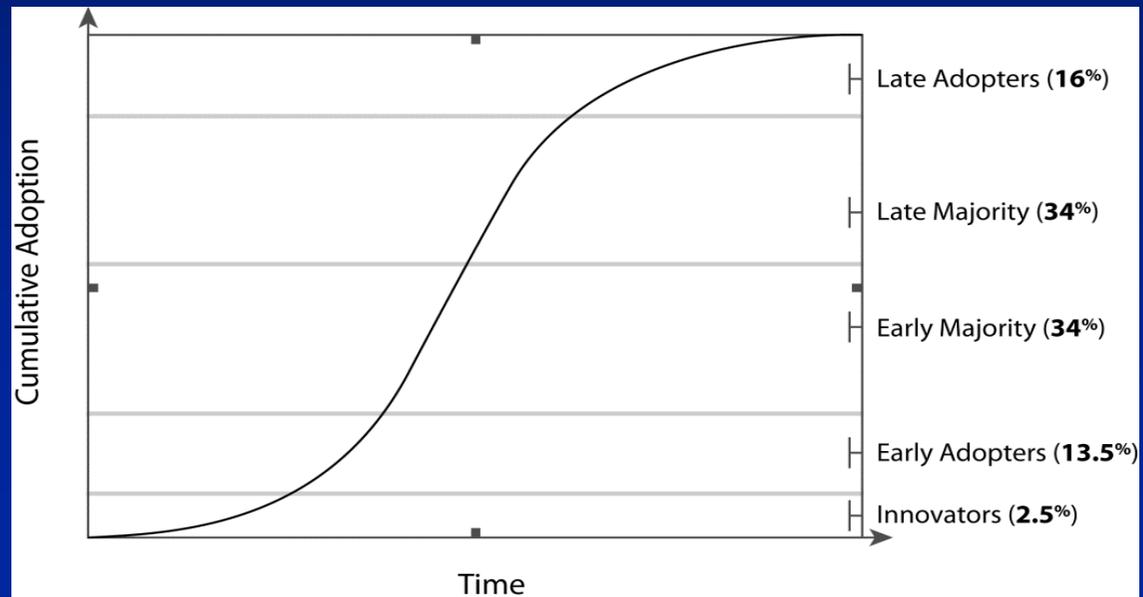
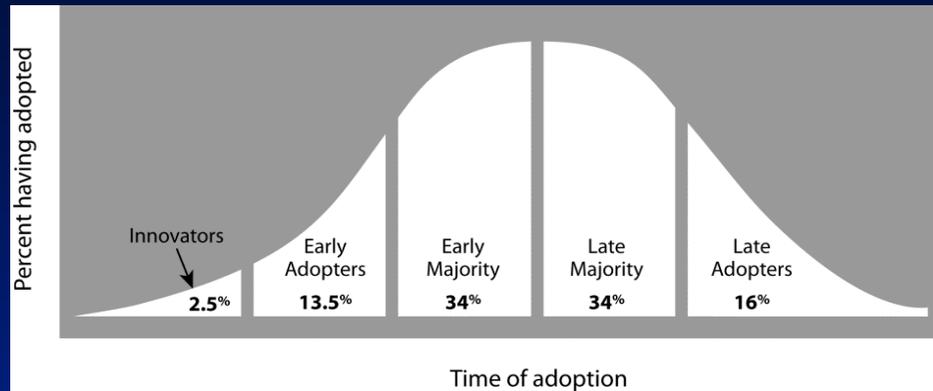
- Seminal article in 1943 on diffusion of hybrid seed corn in two Iowa communities
 - Key findings
 - Adoption as key dependent variable, change agents, importance of different communication channels



How fourteen Midwest farmers obtained information on a new farm practice. Farm locations are shown against a mile grid.

Diffusion of Innovations

- Diffusion =
 - the process through which an innovation is communicated through certain channels over time among the members of a social system
 - Most influential theory guiding dissemination science (Rogers)
 - Early development emphasized temporal patterns and actor characteristics



More Recent Evolution to Models like RE-AIM

To determine the characteristics of interventions that can:

- Reach large numbers of people for 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

Too often, the current situation...

“The law of halves” ... a story

...(sort of) hypothetical

The reality of translating an evidence-based *(fill in blank)* intervention

<u>ISSUE</u>	<u>RE-AIM ELEMENT</u>	<u>SUCCESS RATE</u>	<u>POPULATION- WIDE IMPACT</u>
Settings that Participate	ADOPTION	40%	40%
Patients Who Accept	REACH	40%	16%
Program Delivery	IMPLEMENTATION	40%	6.4%
RCT Efficacy Results	EFFECTIVENESS	40%	2.6%
Longer-term Effects	MAINTENANCE (Individual Level)	40%	1.0%

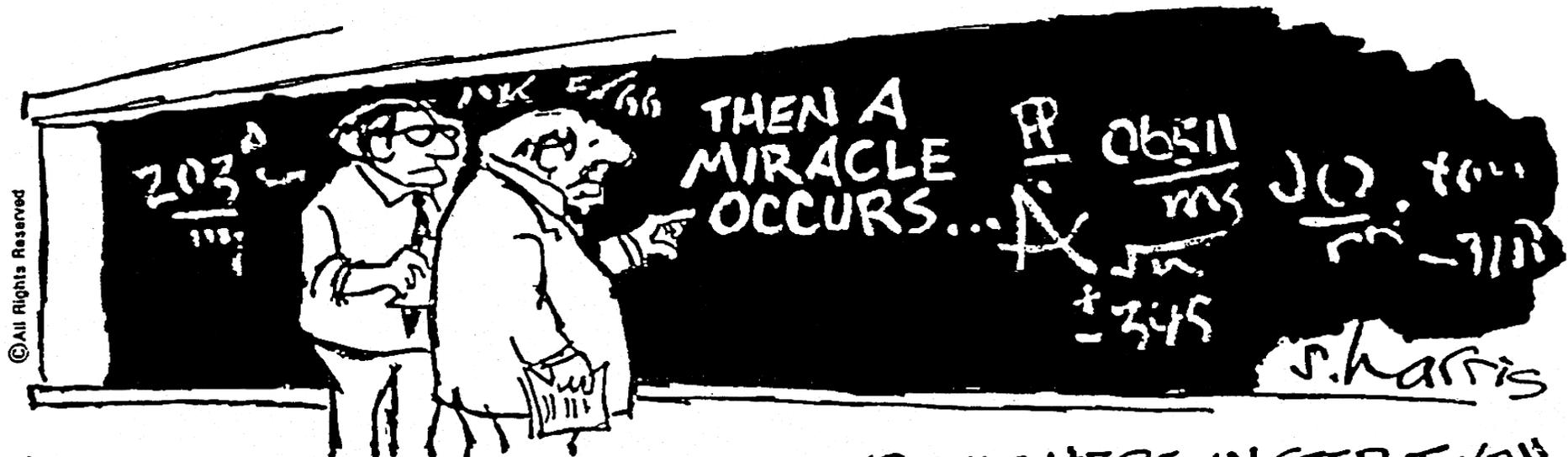
The moral of the story?

“Focus on the Denominator”
(not just the numerator)

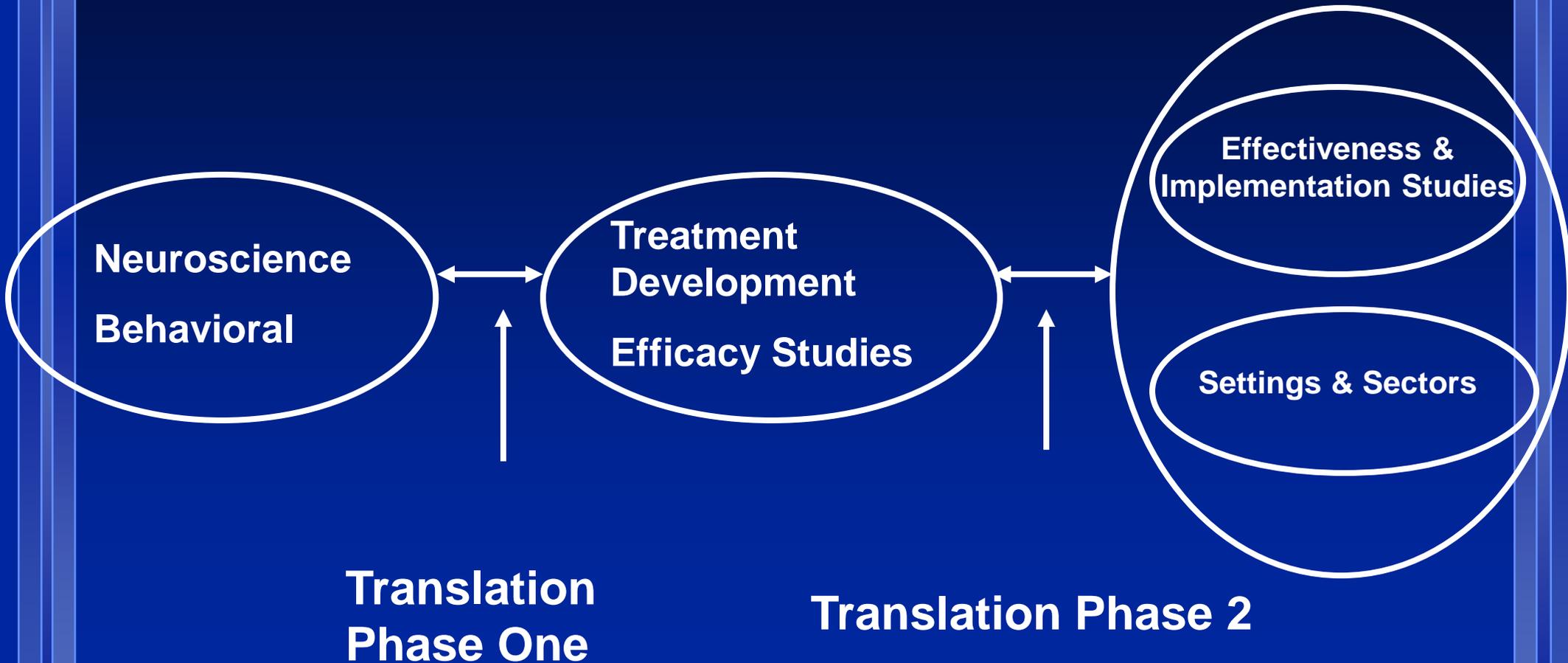
(Each step of the dissemination
sequence, or each “RE-AIM”
dimension is important)

Unraveling the "Black Box"

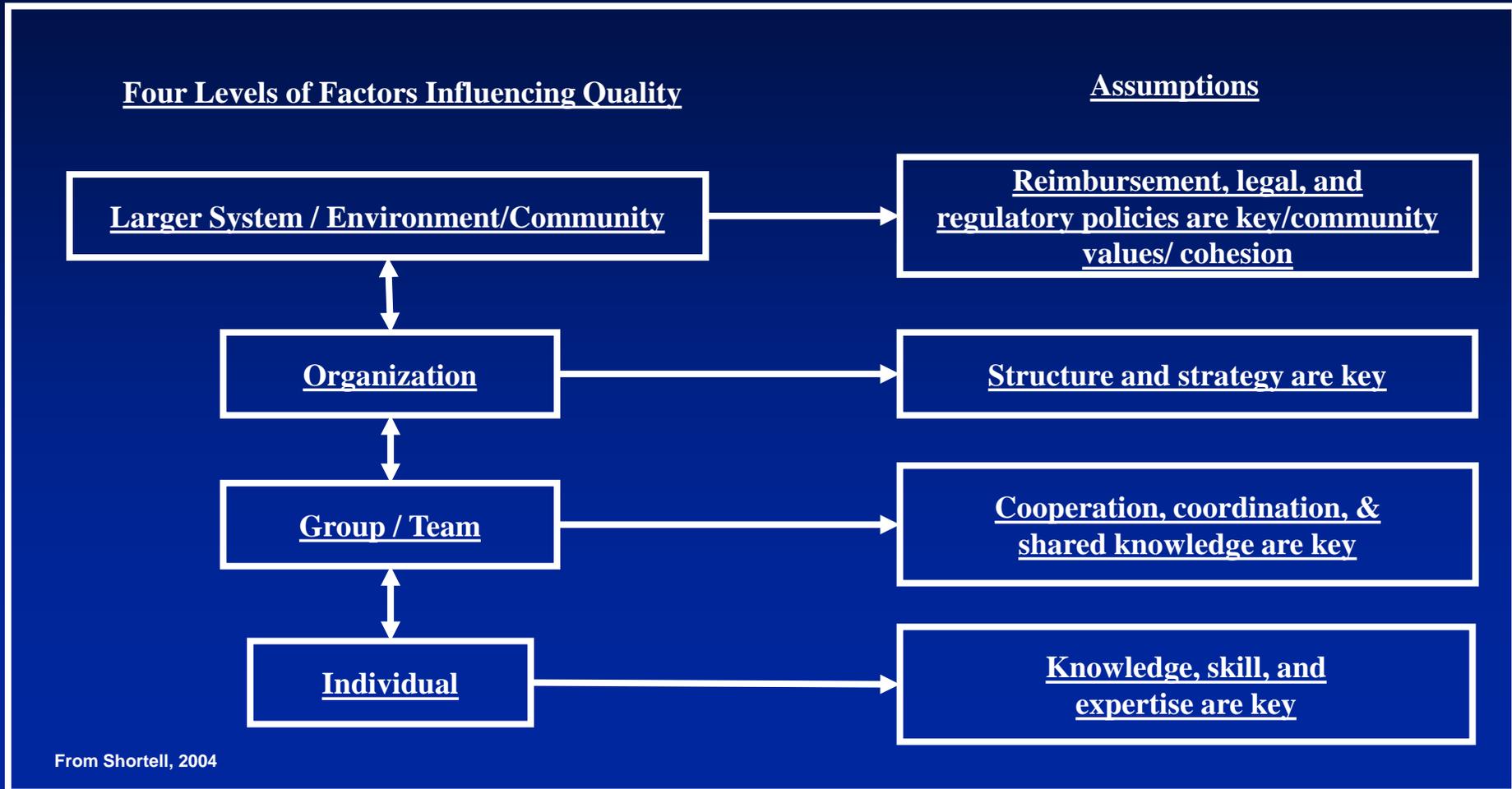
Moving from passive to active D&I



Simple D&I pipeline model



D&I science is inherently *ecological*



Phases of translational research

T1 studies: basic research science translated to humans

T2 studies: translate clinical application into evidence based guidelines

T3 studies: translate evidence-based guidelines into health and community practice

T4 studies: evaluate 'real world' health outcomes of a clinical application in practice

Value of implementation research

- *T2 research can do more to decrease morbidity and mortality than a new imaging device or a class of drugs*

Wolff, S. H. (2008) The meaning of translational research and why it matters. JAMA, 299 (2), 211-213.

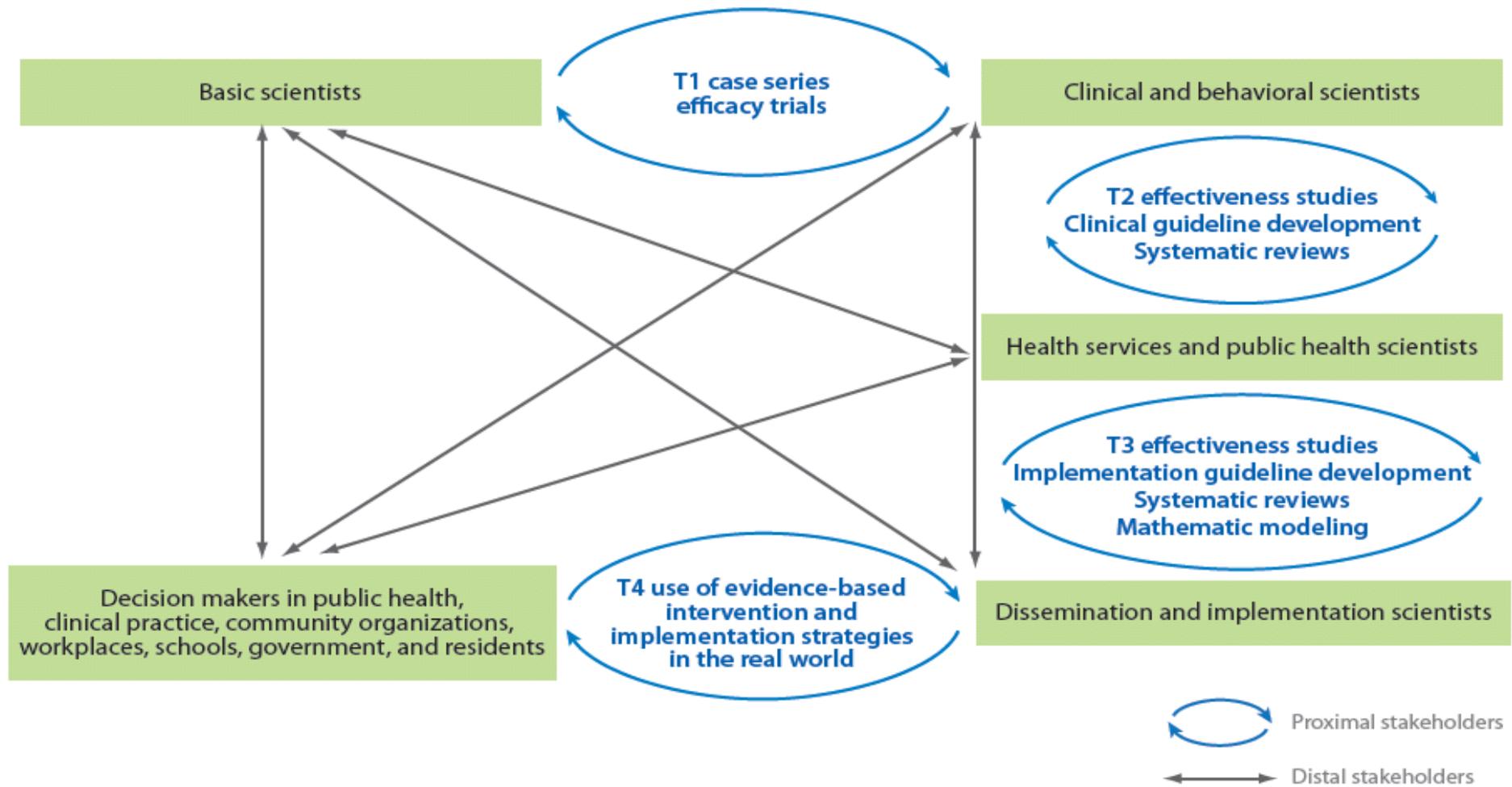


Figure 1

Examples of stakeholders at translational steps in the NIH Roadmap Initiative.

Value of IR: studies show that

- Quality of care can be improved by more than 200% by implementing performance feedback systems for clinicians
- ...and by 400% by implementing institutional reminder systems.
- Implementation strategies can boost the effectiveness of treatments by more than 30%,
- ...and reduce staff turnover by 50%.

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

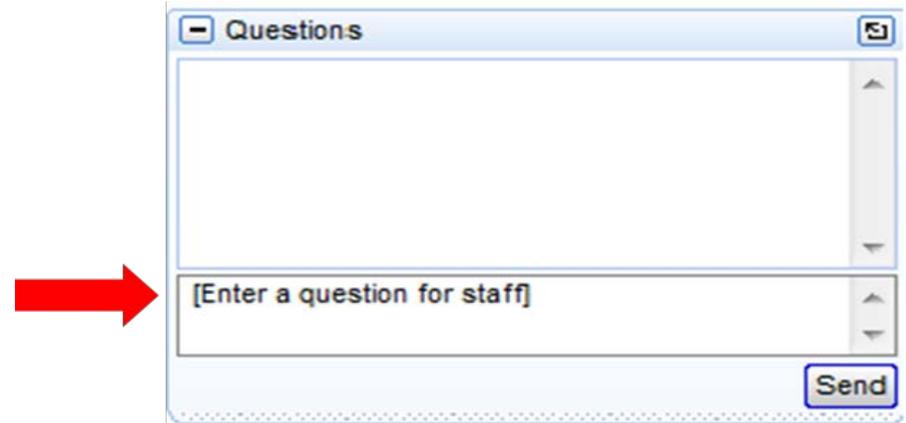
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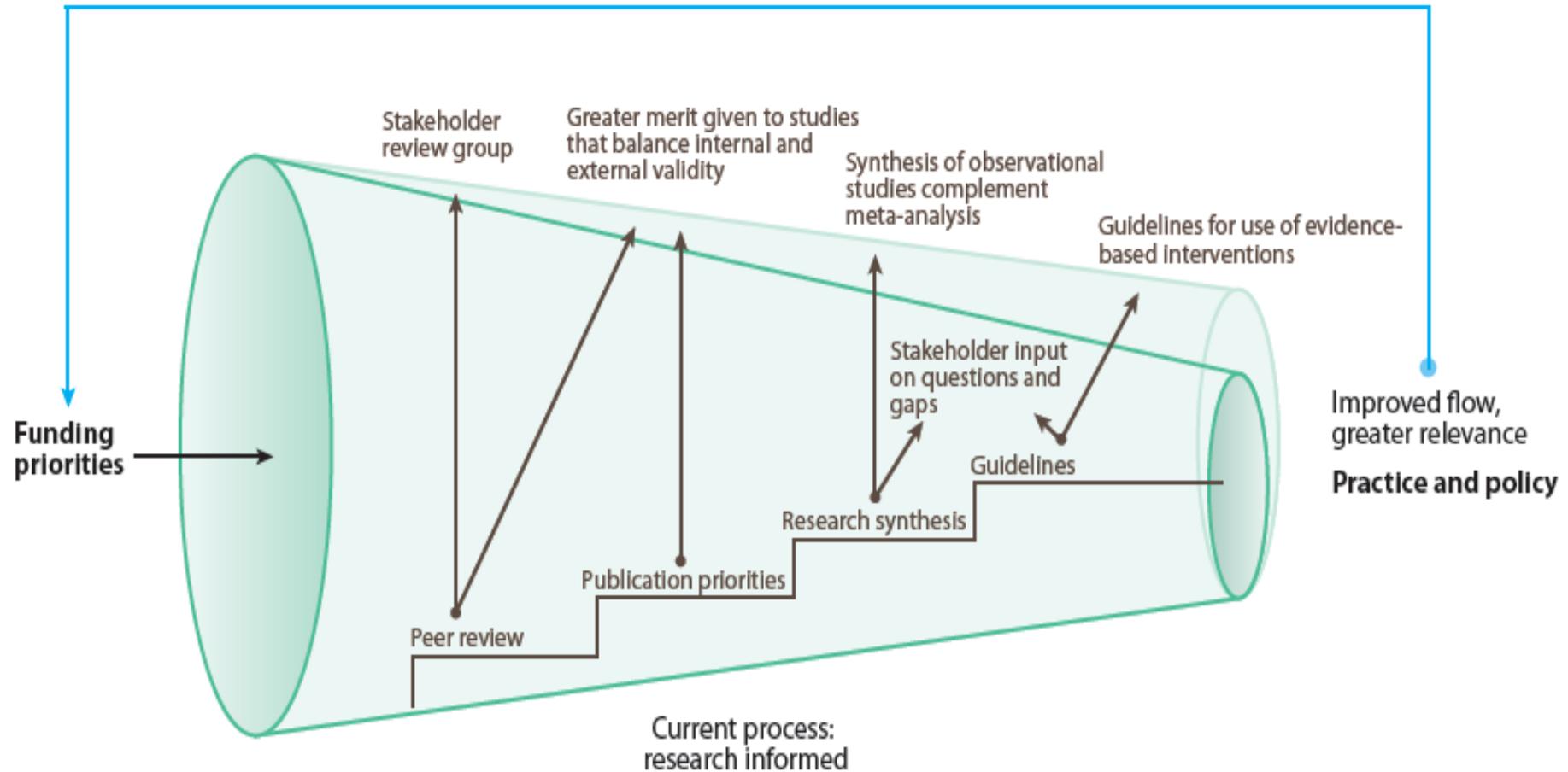


Opportunities:

**Dissemination & Implementation
Science in the context of practice-
based research**

1. Work at the top of the pipeline

Proposed process:
increase stakeholder input and reporting on external validity



2. Make better use of models/frameworks

- Outlined in Tabak *et al.*, proliferation of models: 61 reviewed!!
 - Context is critical
 - 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

3. Design for dissemination (D4D)

- Some data from a national survey of 266 US researchers
 - 17% always/usually plan dissemination with some theory or framework
 - 32% always/usually provide shorter summaries
 - 34% always/usually involve stakeholders in D4D

3. Design for dissemination

- Think about dissemination at the beginning of a research project
 - Systems changes
 - Shift funder, academic priorities/incentives
 - Processes
 - Engage stakeholders early and often
 - Products
 - Frame messages, develop brief summaries

Cancer: improving early detection and prevention. A community practice randomised trial

Allen J Dietrich, Gerald T O'Connor, Adam Keller, Patricia A Carney, Drew Levy, Fredrick S Whaley

BMJ VOLUME 304 14 MARCH 1992

Provider Education
Office systems intervention

ORIGINAL INVESTIGATION

Improving Colorectal Cancer Screening by Targeting Office Systems in Primary Care Practices

Disseminating Research Results Into Clinical Practice

Esther K. Wei, ScD; Catherine T. Ryan, MPH; Allen J. Dietrich, MD; Graham A. Colditz, MD, DrPH

Arch Intern Med. 2005;165:661-666

Tools and Strategies to Increase Colorectal Cancer Screening Rates

A practical guide for health insurance plans



Version 5/04

4. Build more practice-based research

“Where did the field get the idea that evidence of an intervention’s efficacy from carefully controlled trials could be generalized as *THE* best practice for widely varied populations and settings?”

--L.W. Green

4. Build more practice-based research (Cont'd)

- Evaluated via natural experiments
- Particularly important in lower resource settings
 - For example, practice in areas with high health disparities, international settings

5. Build more academic incentives & capacity

- Provide incentives/credit for promotion/tenure
- Hire faculty with practice experience or provide opportunities to work in practice

5. Build more academic incentives & capacity (Cont'd)

- Train together with practitioners & community members
- Provide more student opportunities for practice experience

5. Build more academic incentives & capacity (Cont'd)

- Training opportunities

- Mentored Training in Dissemination and Implementation Research for Cancer

- MTDIRC.org

- Implementation Research Institute

- <http://cmhsr.wustl.edu/Training/IRI/Pages/ImplementationResearchTraining.aspx>

- Training Institute for Dissemination and Implementation Research in Health

- <http://conferences.thehillgroup.com/OBSSRinstitutes/TIDIRH2015/index.html>

6. Address policy issues in your research

- Another opportunity for natural experiments
- Think of both Big P, small p
- Messy, and think of the difficulty in assigning independent variable

For policy...

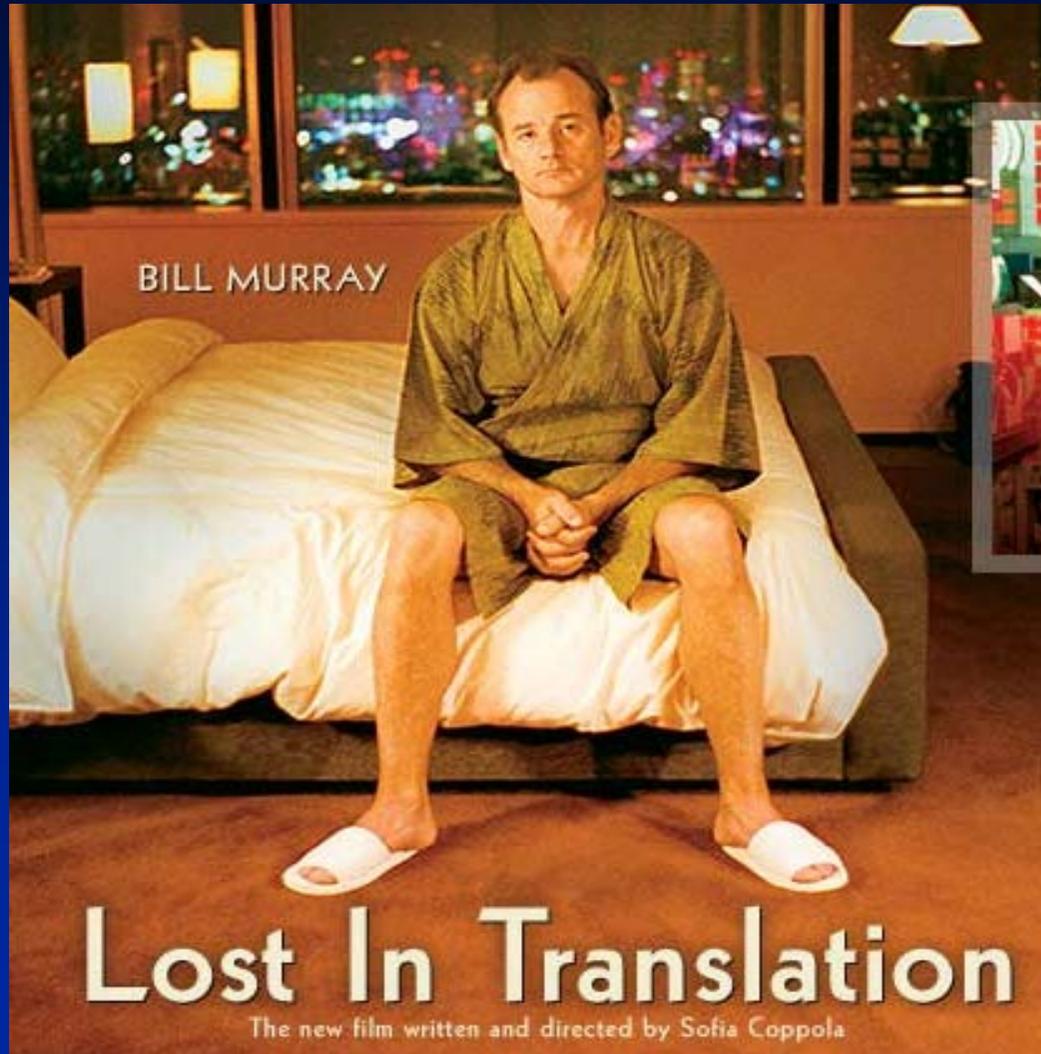
“Laws are like sausages.
You should never watch them
being made.”

Honoré Mirabeau, 1918

Take home points

1. There are vast opportunities for D&I research in practice settings.
2. Many theories/approaches are present with many overlapping constructs.
3. The messier the research topic, the lesser the amount of solid D&I research.

Let's not be Bill Murray...



Further reading

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Kingdon JW. *Agendas, Alternatives, and Public Policies*. New York: Addison-Wesley Educational Publishers, Inc.; 2003.

Lobb R, Colditz GA. Implementation Science and its Application to Population Health. *Annu Rev Public Health*. Jan 7 2013.

Proctor EK, Powell BJ, Baumann AA, Hamilton AM, Santens RL. Writing implementation research grant proposals: ten key ingredients. *Implement Sci*. 2012;7:96.

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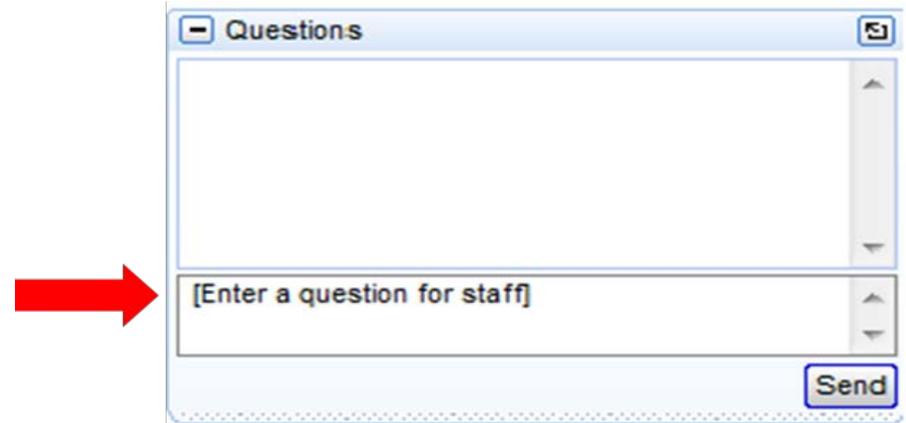
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- **September 9, 1:30 – 3:00pm ET:** *Using Rapid-Cycle Research to Reach Goals: Awareness, Assessment, Adaptation, Acceleration-A Guidance Document*

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