Center for American Indian and Alaska Native Diabetes Translation Research (CAIANDTR) Webinar Series

Centers for American Indian & Alaska Native Health
colorado school of public health

THIS WEBINAR IS FUNDED BY NIDDK THROUGH CAIANH'S DIABETES TRANSLATION RESEARCH CENTER (P30 DK092023).

Welcome and Housekeeping

- Please mute your line when not speaking
- Feel free to add comments and questions in the chat box
- Presentation by Dr. Jodi Summers Holtrop followed by Q&A and discussion

- Slides from today's presentation and announcements of future Webinars will be available on the CAIANDTR webpage:
  - http://www.ucdenver.edu/academics/colleges/PublicHealth/research/centers/CAIANH/cdtr/Pages/Webinars.aspx

DISSEMINATION AND IMPLEMENTATION (D&I) RESEARCH: WHAT IT IS AND HARNESSING IT FOR DIABETES PREVENTION AND CARE

JODI SUMMERS HOLTROP, PHD

SENIOR IMPLEMENTATION SCIENTIST, ACCORDS

ASSOCIATE PROFESSOR AND ASSOCIATE VICE CHAIR FOR RESEARCH, DEPARTMENT OF FAMILY MEDICINE

UNIVERSITY OF COLORADO SCHOOL OF MEDICINE

ACCORDS
ADULT AND CHILD CONSORTIUM FOR HEALTH OUTCOMES RESEARCH AND DELIVERY SCIENCE
UNIVERSITY OF COLORADO | CHILDREN'S HOSPITAL COLORADO

SCHOOL OF MEDICINE
Department of Family Medicine
UNIVERSITY OF COLORADO ANSCHUTZ MEDICAL CAMPUS

Acknowledgments and Conflicts of Interest

ACKNOWLEDGMENTS

- Borsika Rabin
- Russell Glasgow
- David Chambers
- University of Colorado SOM - ACCORDS D&I Science Program

FINANCIAL DISCLOSURE

- National Institutes of Health (NIH), Agency for Healthcare Research and Quality (AHRQ), and Patient Centered Outcomes Research (PCORI) funding on various projects

FUNDING

- This Webinar is funded by NIDDK through CAIANH's Diabetes Translational Research Center (P30 DK092923)

UNLABELED/UNAPPROVED USES DISCLOSURE

- None

Objectives

By the end of the presentation, you should be able to:

1. Define and describe the importance of dissemination and implementation research and contrast it with doing implementation and dissemination activities.
2. Discuss key D&I frameworks and use of mixed methods.
3. Provide examples of the use of D&I for diabetes prevention and care programs.
4. Identify resources and opportunities for further training/knowledge on D&I.

What are we talking about?

- Defining what we mean by the terms we use

Question:

- What are some programs, policies or approaches that are intended to have a positive effect on patients?

We call these EVIDENCE-BASED INTERVENTIONS

Question:

- What are some ways of getting these EVIDENCE-BASED INTERVENTIONS to be taken up and delivered well?

These are what we call IMPLEMENTATION STRATEGIES

Question:

- What are some ways of getting these EVIDENCE-BASED INTERVENTIONS and IMPLEMENTATION STRATEGIES to be widely accessible and useable by many diverse settings?

These are what we call DISSEMINATION STRATEGIES

Term	Description	What we Do (examples)
Implementation	The process of putting a decision or plan into effect; execution	• Support initial uptake • Identify and work with local champions • Provide technical assistance/training
Implementation Research	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.	• Measure the level/degree of implementation • Compare strategies • Identify barriers

Term	Description	What we Do (examples)
Dissemination	The act of spreading something, especially information, widely; circulation	• Understand our target audience • Package the evidence/intervention • Create and use appropriate channels
Dissemination Research	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	• Measure the rate and speed of dissemination • Identify who was and wasn't reached • Compare approaches

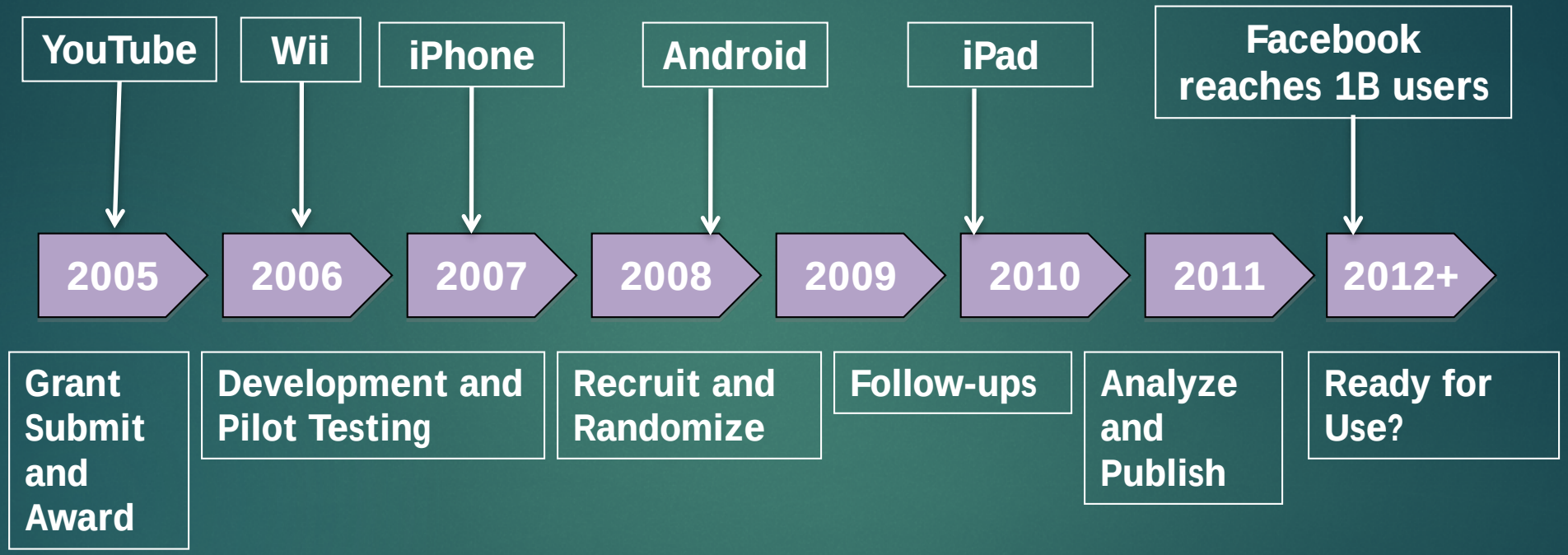
So why is D & I Research Important?

AND NOBODY CAN USE IT…..

DOES IT STILL MAKE AN IMPACT?

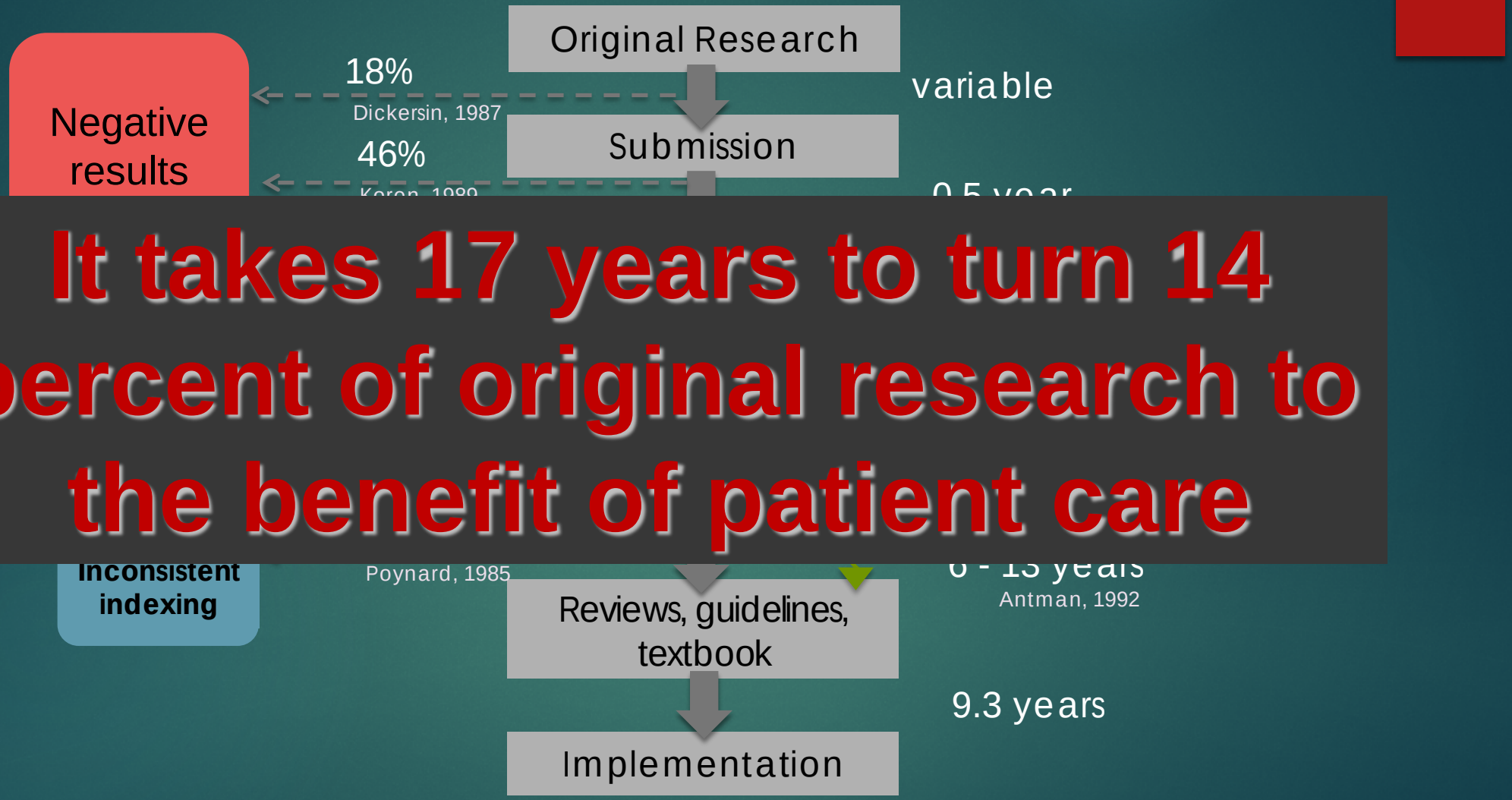
T1-T4 Continuum

How to Evaluate Innovations that Outpace Usual Research Timelines?



Adapted from Riley et al, 2013

“PUBLICATION PATHWAY” Balas & Boren, 2000



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

An Evidence-Based Cancer Prevention... or Weight Loss... or Mental Health.....or (fill in blank) Story

Even if 100% effective...is only so good as how and whether:

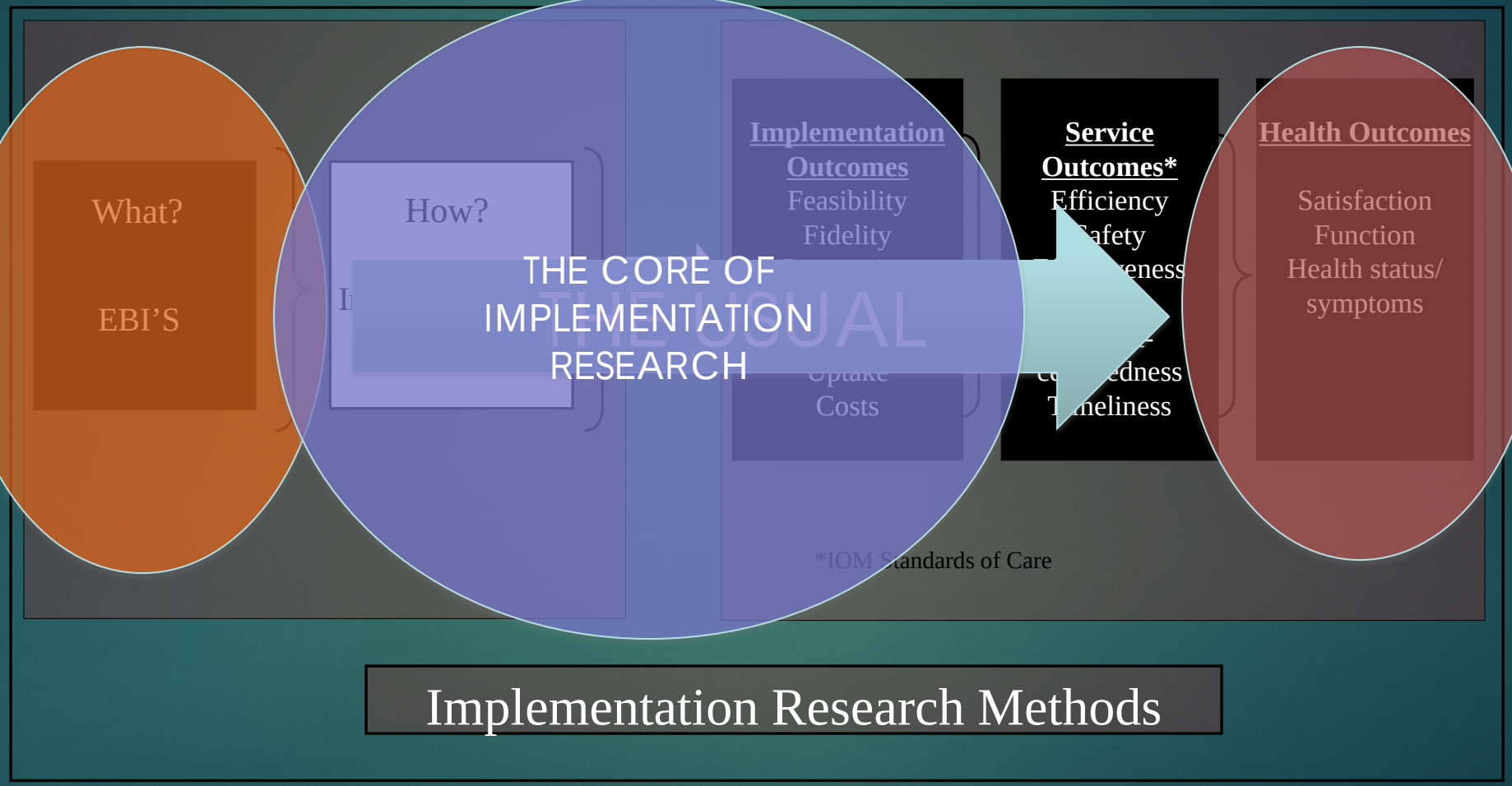
- it is adopted
- practitioners are trained to deliver it
- trained practitioners choose to deliver it
- eligible populations receive it
- it can be sustained

If we assume 50% threshold for each step…

(even with perfect access/adherence/dosage/maintenance)

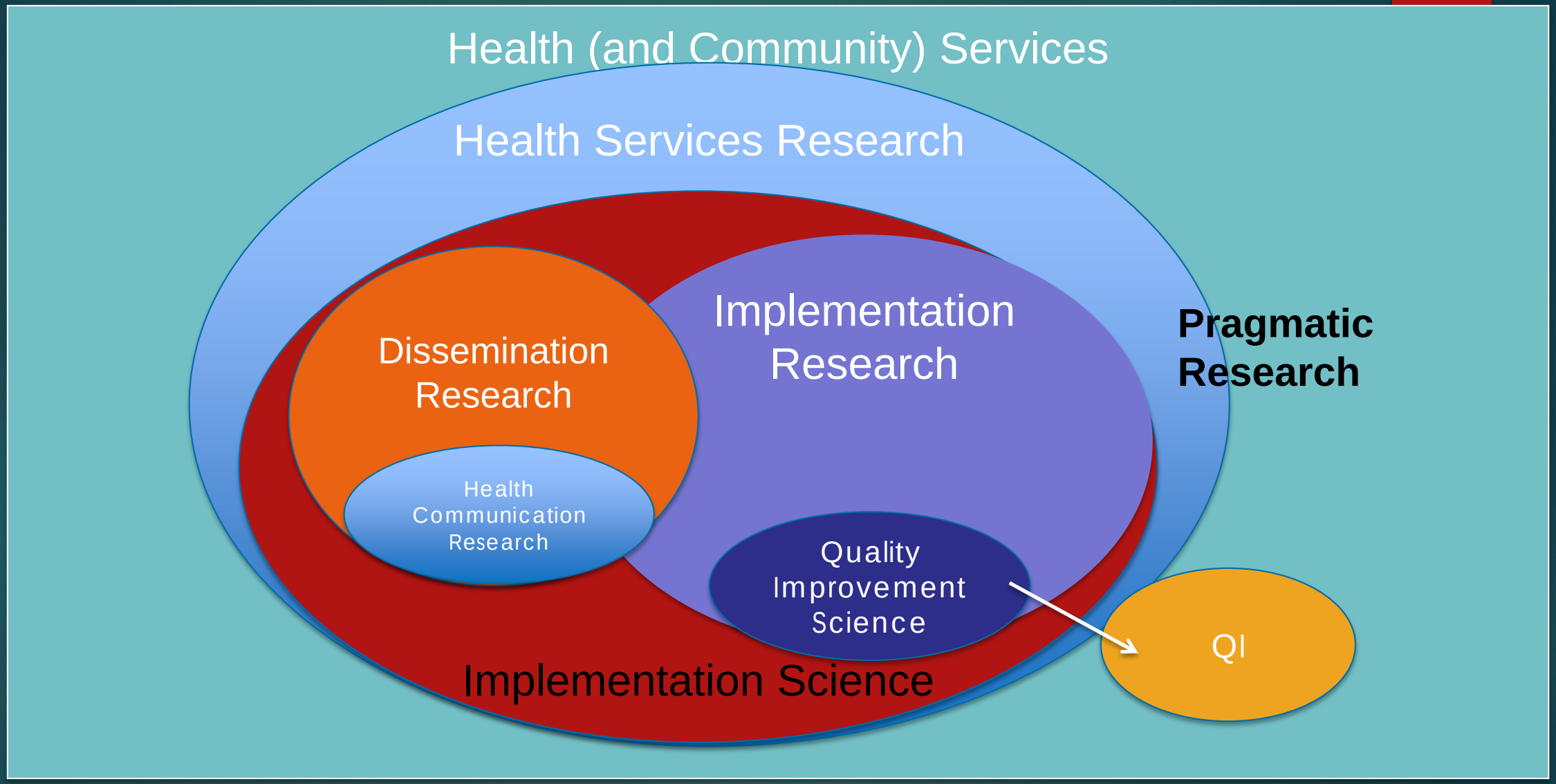
Impact: .5x .5x .5x .5 x .5 = 3% benefit

Studying Implementation



Proctor et al 2009 *Admin. & Pol. in Mental Health & Mental Health Services Research*

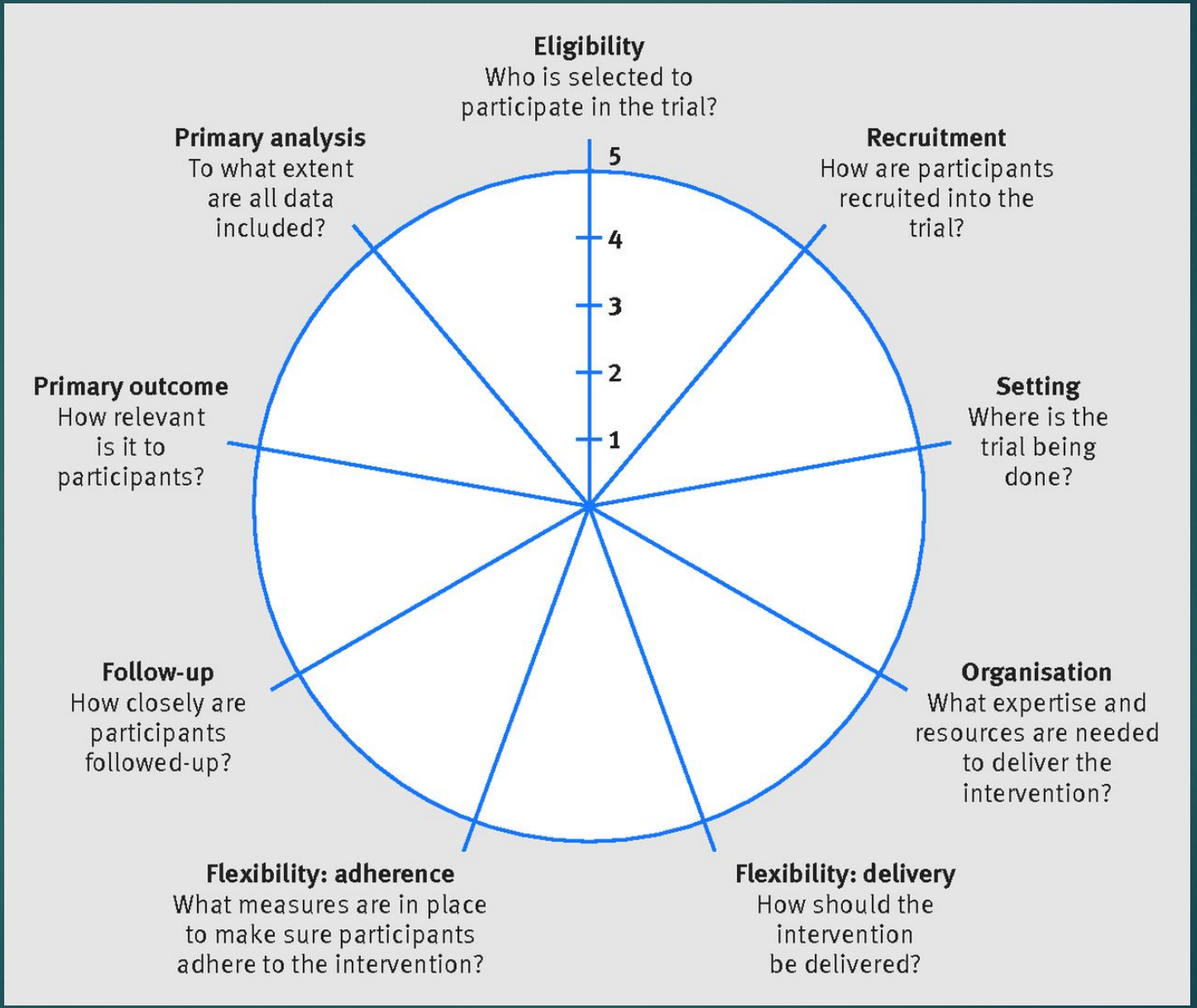
A Big Tent of D & I Terms (and ovals)*



Adapted from Mitchell S, Chambers, D. https://doi.org/10.1200/JOP. 2017.024729;

So what are some ways to examine D & I?

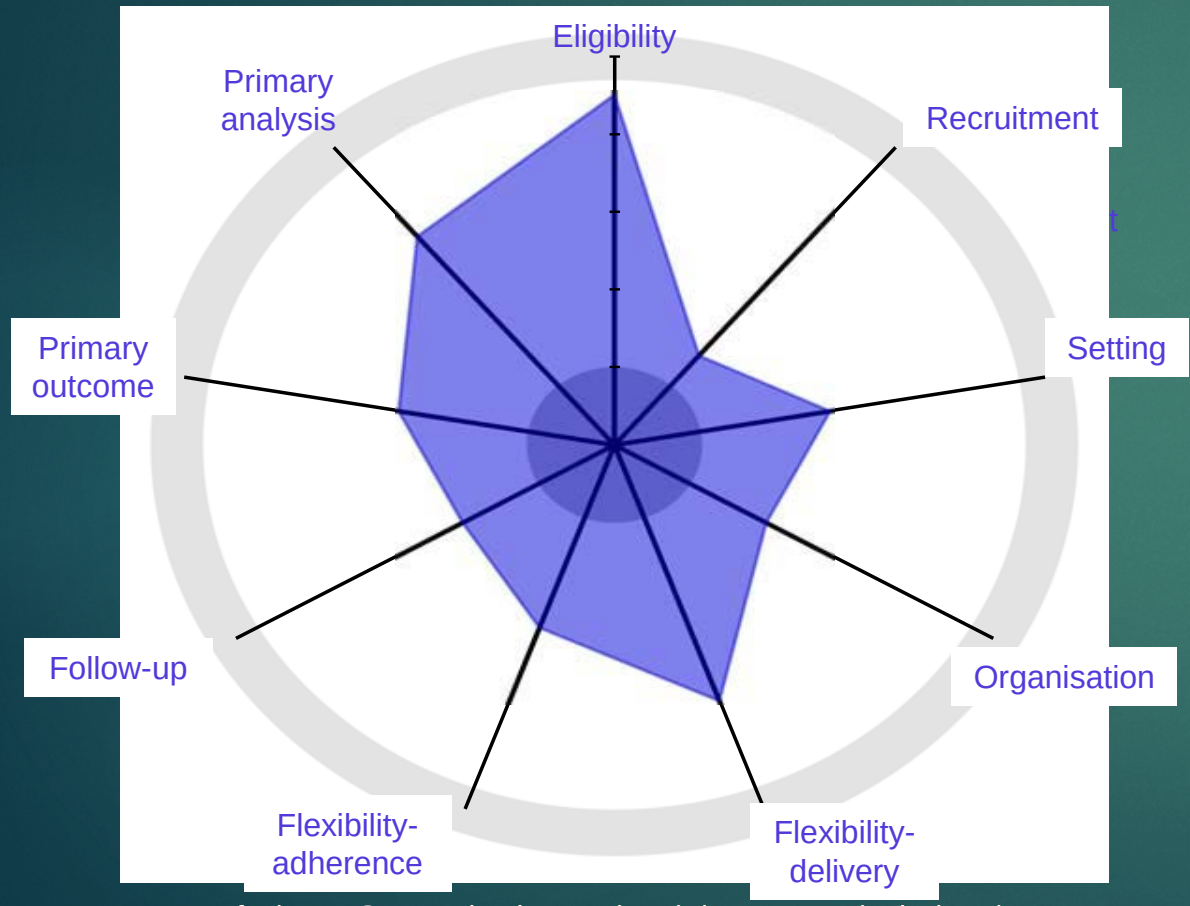
How Pragmatic is your Study? The PRECIS-2 Tool



Loudon et al, *BMJ, 2015; Johnson, Neta et al,* Trials, *2016*

Panel A: Explanatory trial of cognitive behavioral therapy to prevent chronic pain: limited attention to external validity

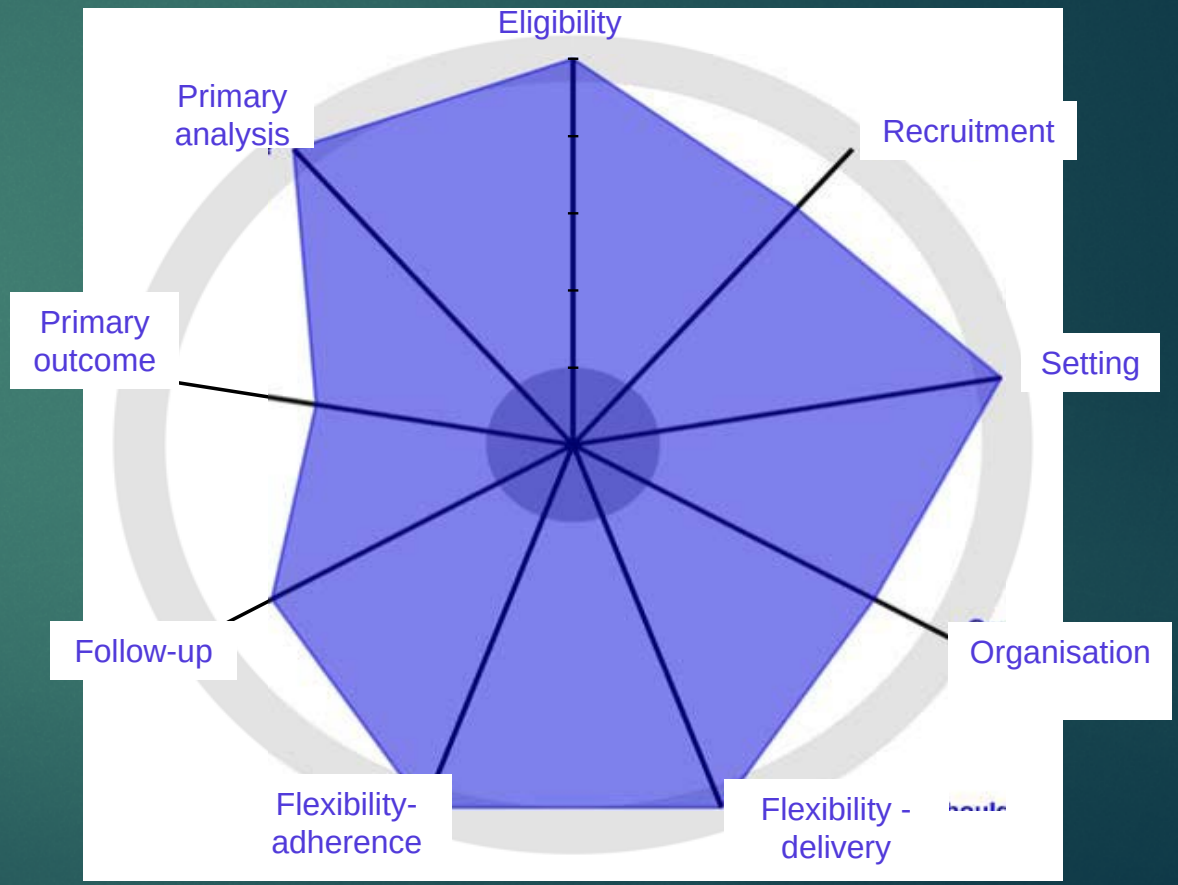
- High score for **Eligibility** but low scores for **Recruitment** and **Settings**: the results are likely to be relevant to patients in the TYPES OF SETTINGS studied, but these patients will not necessarily represent patients in the general population
- Low score for **Organization** means that the resources used for this trial are not common in real-world settings



Macfarlane GJ et al., The Maintaining Musculoskeletal Health (MAmMOTH) Study, BMC Musculoskeletal Disorders, 2016

Panel B: Pragmatic trial of computer-supported tailored asthma education mailers: major attention to external validity

- High scores for **Eligibility**, **Recruitment** methods, and **Setting** suggests excellent generalizability to other patients and settings
- High score for **Organization** means most settings could deliver this program
- High scores for **Flexibility** means that real-world implementation is likely to find the same results as in the study
- Middle score for **primary outcome** (hospital admissions for asthma) suggests this may not be the most meaningful outcome to patients



Osman LM, et al: Grampian Asthma Study of Integrated Care (GRASSIC). BMJ, 1994.

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.* 2012;5(1):48

Through the eyes of RE-AIM

Dimension	
Reach	Number, percentage and representativeness of eligible patients who participated in the intervention. •Is the intervention reaching the target population? Those most in need?
Effectiveness	Intervention effects on targeted outcomes, •Does the intervention accomplish its goals?
Adoption	Number, percentage and representativeness of participating settings and providers. •To what extent are those targeted to deliver the intervention participating?
Implementation	The extent to which the intervention was consistently implemented by staff members.
Maintenance	The extent to which an intervention becomes part of routine organizational practices, and maintains effectiveness.

Glasgow, www.re-aim.org

Purpose and History of RE-AIM Framework

- Intended to facilitate translation of research to practice
- Internal and external validity, and emphasizes representativeness
- Individual and organizational factors - experimental and observational
- Public health impact depends on all elements (reach x effectiveness, etc.)

www.re-aim.org

RE-AIM Summary Points

- RE-AIM is not a theory - but it tells you where to look; where things often break down
- RE-AIM is an outcomes framework that can be used for planning and evaluation
- Each dimension is an opportunity for intervention
- All dimensions can be addressed within a given study (though likely not all intervened upon)
- RE-AIM can be used for observational, efficacy, effectiveness, and implementation science projects

How to apply D & I using RE-AIM to diabetes interventions

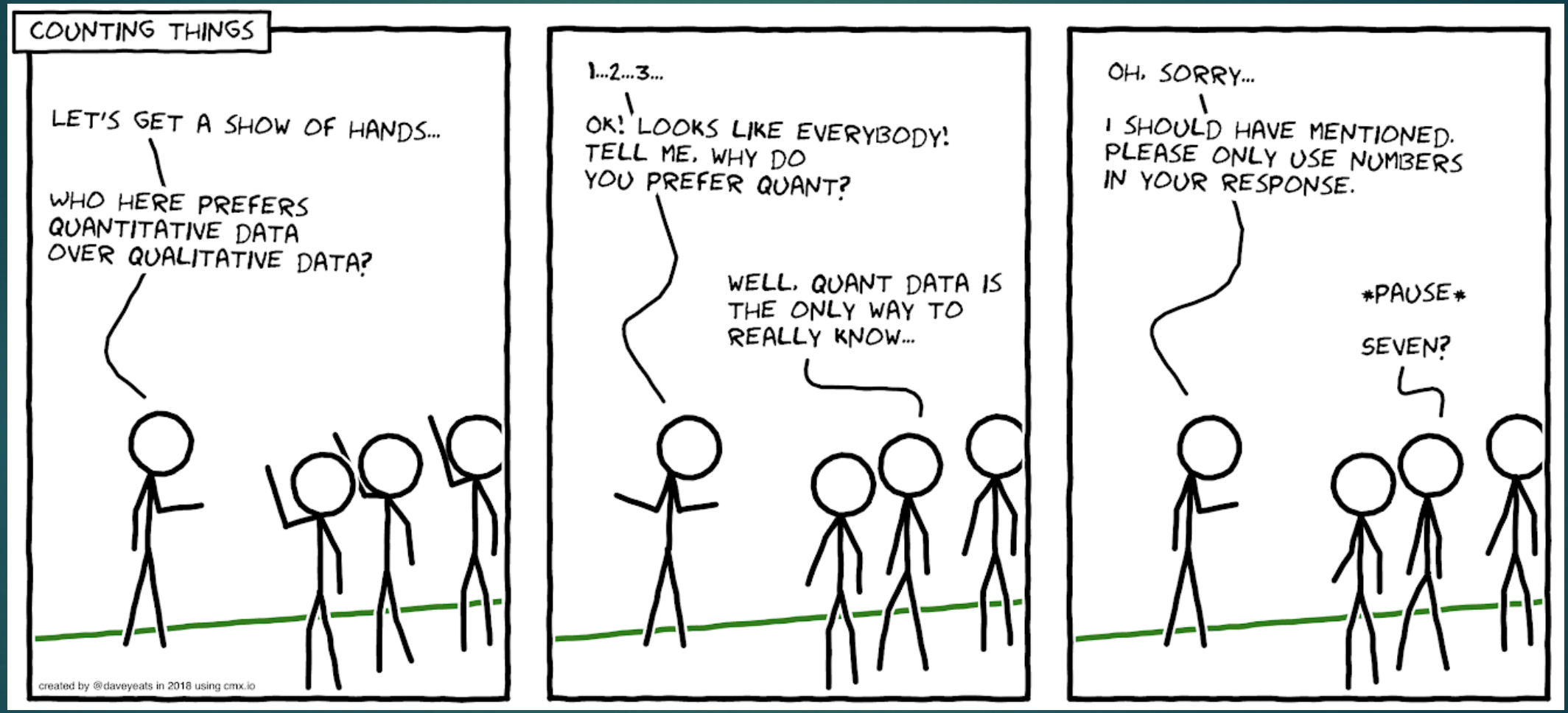
- What are the EVIDENCE-BASED INTERVENTIONS that are available?
- What is being done to get them taken up and used?

Key Components of RE-AIM

RE-AIM Dimension	Key Planning Questions to Consider and Answer
Reach	**WHO** is (was) intended to benefit and who actually participates or is exposed to the intervention?
Effectiveness	**WHAT** is (was) the most important benefit you are trying to achieve and what is (was) the likelihood of negative outcomes?
Adoption	**WHERE** is (was) the program or policy applied and **WHO** applied it?
Implementation	**HOW** consistently is (was) the program or policy delivered, **HOW** will (was) it be *adapted*, **HOW** much will (did) it *cost*, and **WHY** will (did) the results come about?
Maintenance	**WHEN** will (was) the initiative become operational; how long will (was) it be sustained (setting level); and how long are the results sustained (individual level)?

Glasgow R and Estabrooks P, *Preventing Chronic Disease* (2018) 15, E02.

Importance of Mixed Methods



Example: Diabetes Intervention

Intervention: Diabetes Self-Management Program available to patients within a health system

Implementation strategies:

- Referral approach - Program identifies eligible patients and sends reminder to primary care providers to refer to the program
- Training – providers brief training on how to introduce the program and make the referral
- Follow-up results: results come to providers of which patients participate and how they are doing in the program; providers are prompted to share information on progress with patients

Reach

Quantitative

- # of patients participating/# eligible = 100/200
- Frequency of patients with certain characteristics = 90% of those participating are female, white, privately insured (n=90/100) yet 50% of the eligible patient population is male, 30% is other races, and 40% has Medicaid

HOW

- Records of participation
- Patient characteristics from medical record

Qualitative

- Why was it that only 50% participated?
- What happened to the other patient types with regard to their participation?
- What other characteristics might be of interest in patient participation?

HOW

- Listen to non-participants and ask them (interview)
- Have them take pictures of what their diabetes means to them and their life (photovoice)

Effectiveness

Quantitative

- Change in health outcomes in participating patients. Goal of the program is to get patients to an Hemoglobin A1c of less than 8.
- 50% (N=50) of the participants were able to lower their A1c to less than 8
- The mean reduction in A1c was .7%.

HOW

- Medical record data query

Qualitative

- Is the reduction of .7% or of 50% of the patients clinically meaningful for providers or patients? Was it worthwhile?
- Is this an appropriate indicator of diabetes control? What other measures are meaningful that impact patients lives?
- What are the characteristics of the patients that did not improve?

HOW

- Talk to patients about how they made changes (Critical incident interview)
- Observe practice teams and discussions of implications

Adoption

Quantitative

- # of settings that tried the intervention; # of providers who provided the intervention. Intervention was taken up by Practices A, B and C, but not D and E.
- In practice A, providers 1,2 and 3 referred patients (physicians), but not providers 4 and 5 (physicians assistants)

HOW

- Tracking of participation by program
- Survey of practice culture

Qualitative

- Why did some practices refer patients and others did not?
- Why did some providers refer patients and some did not?

HOW

- Document review from meeting notes
- Interview with non-adopters (“why’s”)
- Practice observation and/or shadowing of roles

Implementation

Quantitative

- % adherence to core components; cost to implement; # drop out of implementation; # types of unintended consequences

HOW

- Have staff complete logs with checklists
- Assess costs to implement
- Reporting of outcomes

Qualitative

- What was the impact of the program delivery costs?
- Did the participants find the intervention acceptable?
- Were they able to implement the core components with fidelity? What made it difficult or not possible to do so?
- What adaptations occurred and were they planned or responsive?
- Were there unintended consequences?

HOW

- Watch patient visits (Observation)
- Conduct process or cognitive task maps (Interview)
- Interview staff (appreciative inquiry)

Maintenance

Quantitative

- # of sites that continued intervention past the study

HOW

- Tracking of site participation

Qualitative

- What factors were in play that caused some practices to stop referring?

HOW

- Focus groups
- Interview health system leaders

Mixing the Data

Convergent Design

- Analyze quantitative (surveys, EMR clinical data, etc.)
- Analyze qualitative (interviews, observations, etc.)
- Analyze together (integrate, merge, transform)

Exploratory

- Interviews then develop surveys to follow-up

Explanatory

- EMR data then observations to follow-up

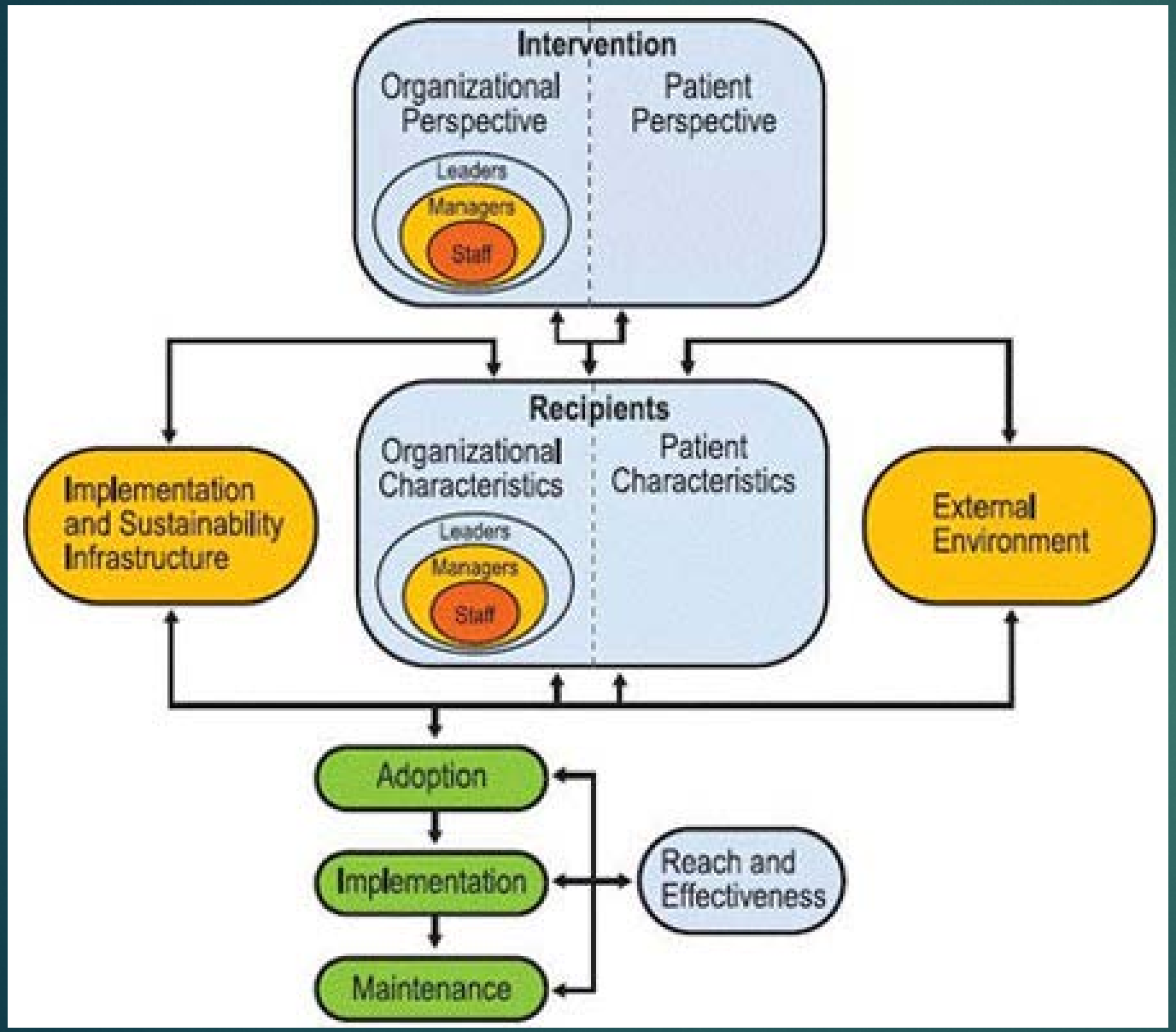
Key Evaluation Questions with RE-AIM

RE-AIM Component	Quantitative	Qualitative
Example data collection methods	EMR, Study tracking/records, surveys, measurements, claims	Interviews, focus groups, observations, document review
Reach – number and representativeness of patients in intervention	# of patients participating/#eligible Frequency of patients with certain characteristics	Factors about patients that influenced participation in total and by certain types of patients
Effectiveness – results of the health impacts on the patients	Change in health outcomes in participating patients	Factors about the influence of the intervention on the outcomes
Adoption – uptake by the settings or intervention agents (providers)	# of settings that tried the intervention; # of providers who provided the intervention	Reasons why sites or providers initiated the intervention
Implementation – way the intervention was implemented that affect the outcomes	% adherence to core components; cost to implement; # drop out of implementation; # types of unintended consequences	Factors that allowed or facilitated the intervention to go well (or not); factors that interfered
Maintenance – sustainment of the intervention past the study period	# of sites that continued intervention past the study	Factors that affected continuation and/or adaption of the intervention
Key Questions	***What happened?***	***Why did it happen? What influenced it happening (or not)?***

Barriers…or opportunities awaiting D & I

- What do you see out there?
- Big Buckets using the Consolidated Framework for Implementation Research (CFIR)
  - Intervention characteristics – beliefs and facts about long-term effectiveness acceptability, cost
  - Outer setting – the larger environment, includes policies and community
  - Inner setting – the place where the intervention is delivered
  - Individuals – those targeted for the intervention or those implementing the intervention
  - Process – how the interventions are delivered and if they work for that setting
- https://cfirguide.org/constructs/

RE-AIM Expanded to PRISM*



*Practical, Robust, Implementation and Sustainability Model

Program Implementation

- National Diabetes Prevention Program (NDPP)
- Proven approach to preventing type 2 diabetes in some individuals
- Year long group program
- Has been provided to patients at Denver Health for several years
  - How to get more people engaged that could benefit?
  - How to maximize outcomes for participants that engage?

American Journal of Health Promotion
1-4

DOI: 10.1177/0890117118786195
journals.sagepub.com/home/ahp
SAGE

Presessions to the National Diabetes Prevention Program May be a Promising Strategy to Improve Attendance and Weight Loss Outcomes

Natalie D. Ritchie, PhD[1,2], Peter G. Kaufmann, PhD[3], R. Mark Gritz, PhD[4], Katherine A. Sauder, PhD[5], and Jodi Summers Holtrop, PhD, MCHES[6]

Abstract

Purpose: The National Diabetes Prevention Program (NDPP) is a widely disseminated lifestyle intervention. Attendance is problematic, leading to suboptimal weight loss, especially among racial/ethnic minority participants. We conducted a novel "presession" protocol to improve engagement of diverse NDPP candidates, comparing NDPP participants who attended a presession to those who did not on attendance and weight loss outcomes.

TBM

ORIGINAL RESEARCH

Effects of physical activity goal attainment on engagement and outcomes in the National Diabetes Prevention Program

Natalie D. Ritchie,[1,2] Jennifer K. Carroll,[2] Jodi Summers Holtrop,[2] Edward P. Havranek[1,2]

Abstract

The National Diabetes Prevention Program (NDPP) is the most widely available behavioral intervention to prevent diabetes, but attrition is a concern and strategies are needed to make the program more engaging. Previous evidence suggests that the 150-min weekly physical activity goal in NDPP is hard for many

[1]Denver Health and Hospital Authority, Denver, CO, USA

[2]University of Colorado School of

Implications

Practice: High attrition is one of the largest barriers to successful dissemination of the National Diabetes Prevention Program (NDPP), and program requirements to obtain at least 150 min of

Remember the 5 Rs to Enhance Pragmatism, D&I Science and Likelihood of Translation

Research that is:

- Relevant
- Rapid and recursive
- Redefines rigor
- Reports resources required
- Replicable

Peek, CJ, et al. (2014). The 5 Rs: An emerging bold. *Annals of Family Medicine*, *12*(5), 447-55. doi:10.1370/afm.1688
deGruy, FV, et al. (2015). A plan for useful and timely family medicine and primary care research. *Family Medicine*, *47*(8), 636-42.

Where do I go to find out more?

www.UCDenver.edu/ACCORDS/implementation

ACCORDS* Dissemination and Implementation Science Program, University of Colorado Denver School of Medicine

Our goal is to:

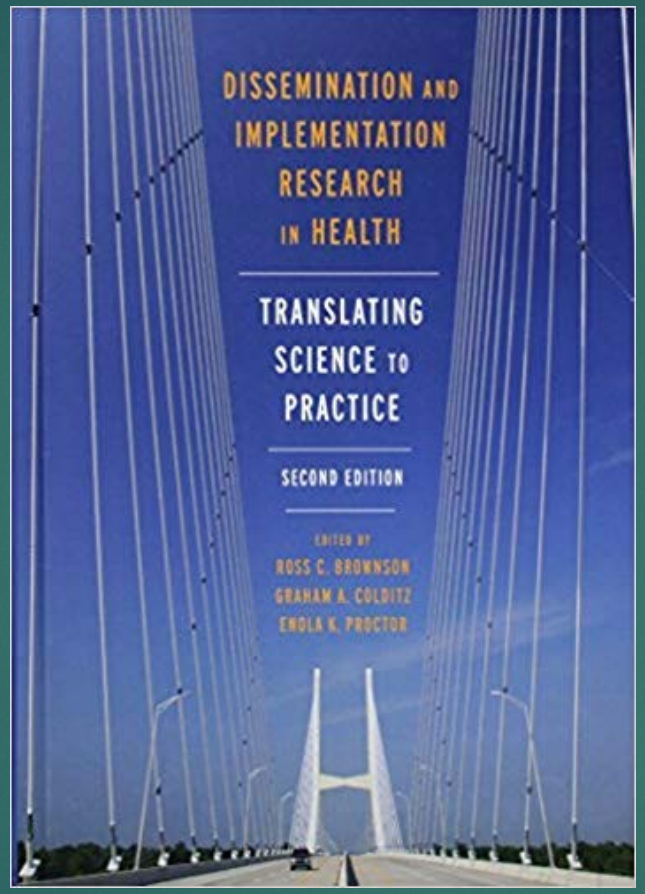
- **Provide local consultation** on D&I related research to increase funding and publication success
- **Create collaborative learning partnerships** with embedded research settings to translate research into practice more quickly and successfully
- **Conduct cutting edge T3-T4 research** on: pragmatic research and measures, adaptation of interventions, designing for dissemination, shared decision making, planning for and evaluation of reach, implementation and sustainability
- **Use interactive on-line resources and support** for patients, medical and public health students, trainees and faculty researchers
- **Communicate the latest information** on D&I related conferences, articles, grant opportunities, events, webinars, talks, and training opportunities

www.ucdenver.edu/accords/implementation

*ACCORDS is the Adult and Child Consortium for Health Outcomes Research and Delivery Science

Implementation Science Training…

https://www.academyhealth.org/events/site/11th-annual-conference-science-dissemination-and-implementation-health



December 2017

Jodi.holtrop@ucdenver.edu