



Introduction to Dissemination & Implementation Science



PAPH 2022

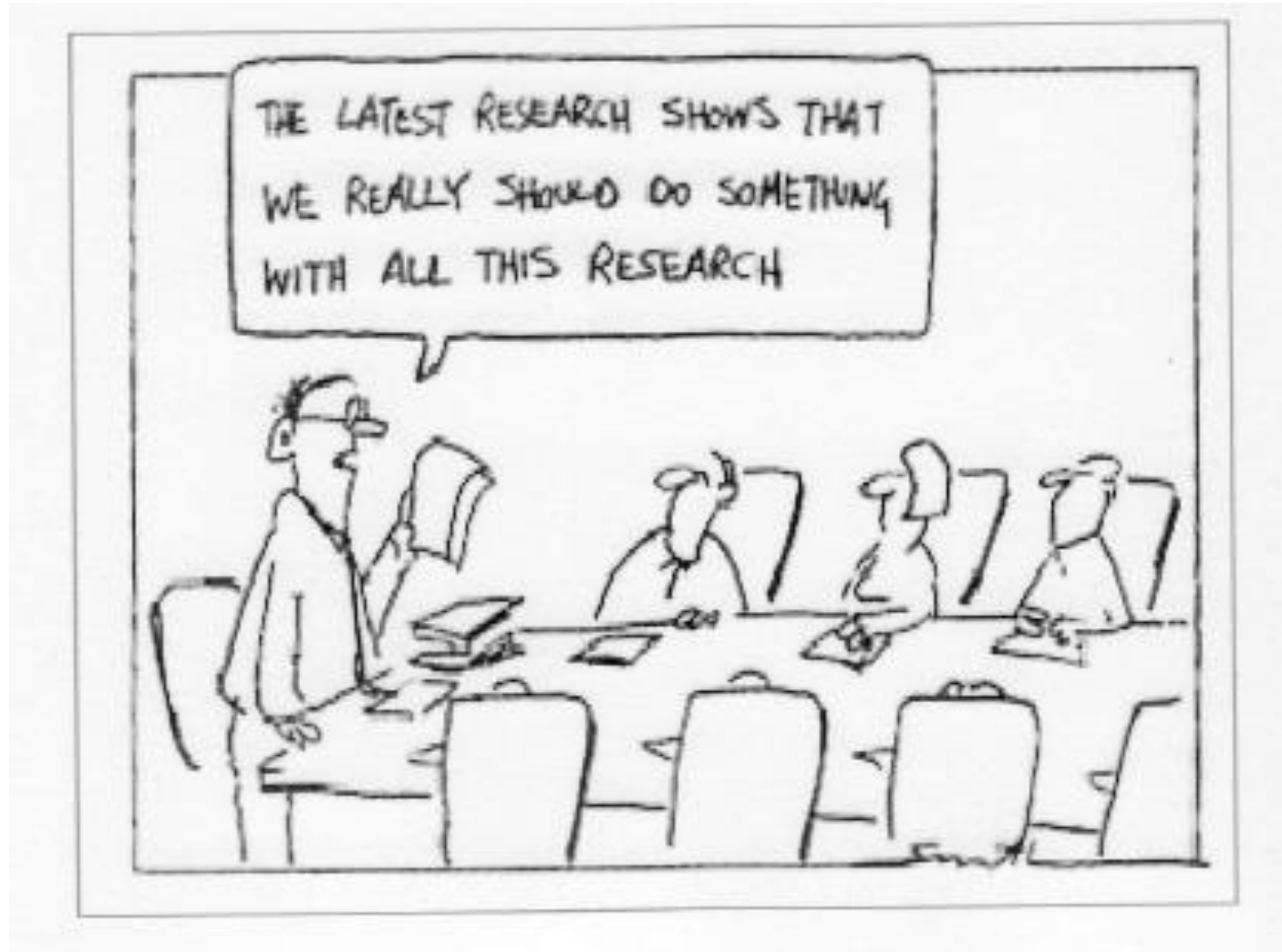
Overview

- ▶ What is Dissemination and Implementation (D&I) science and why is it important?
- ▶ Key terms, definitions, and methods
- ▶ Designing for Dissemination

- ▶ Please ask questions or bring discussion points throughout



Why are you pursuing PAPH research?

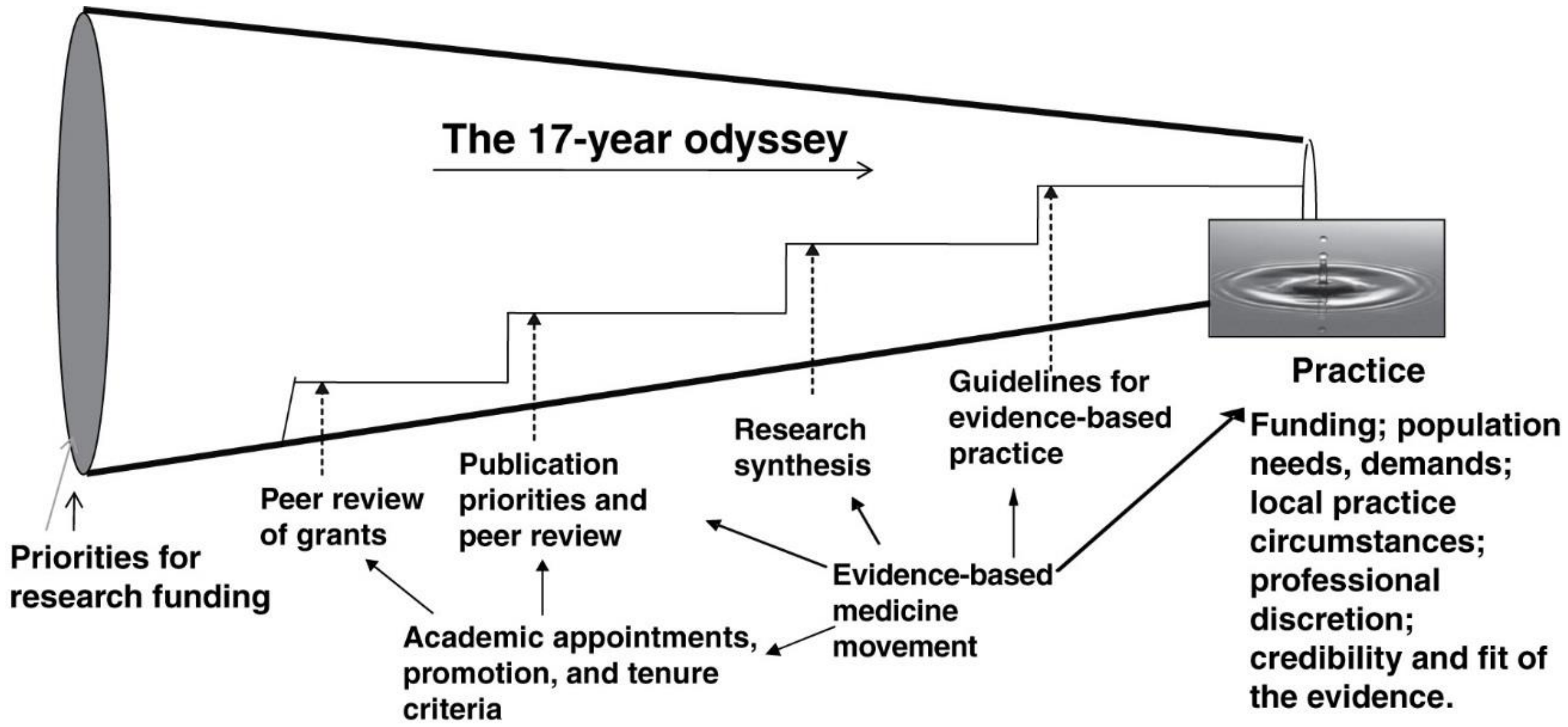


Where are you right now?

- ▶ Not familiar with D&I Science
- ▶ Exploring D&I Science
- ▶ Starting to apply D&I Science
- ▶ Confident in D&I Science expertise

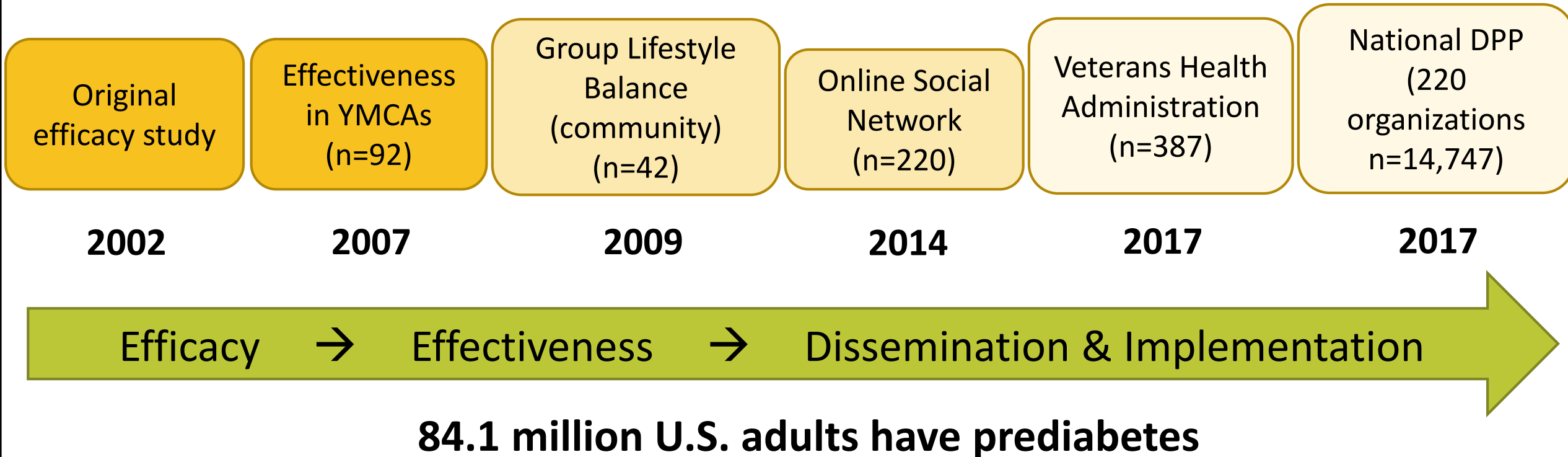
- ▶ Please share a bit about your D&I Science experience





AR Green LW, et al. 2009.
 Annu. Rev. Public Health. 30:151–74

Translation of the Diabetes Prevention Program (DPP)

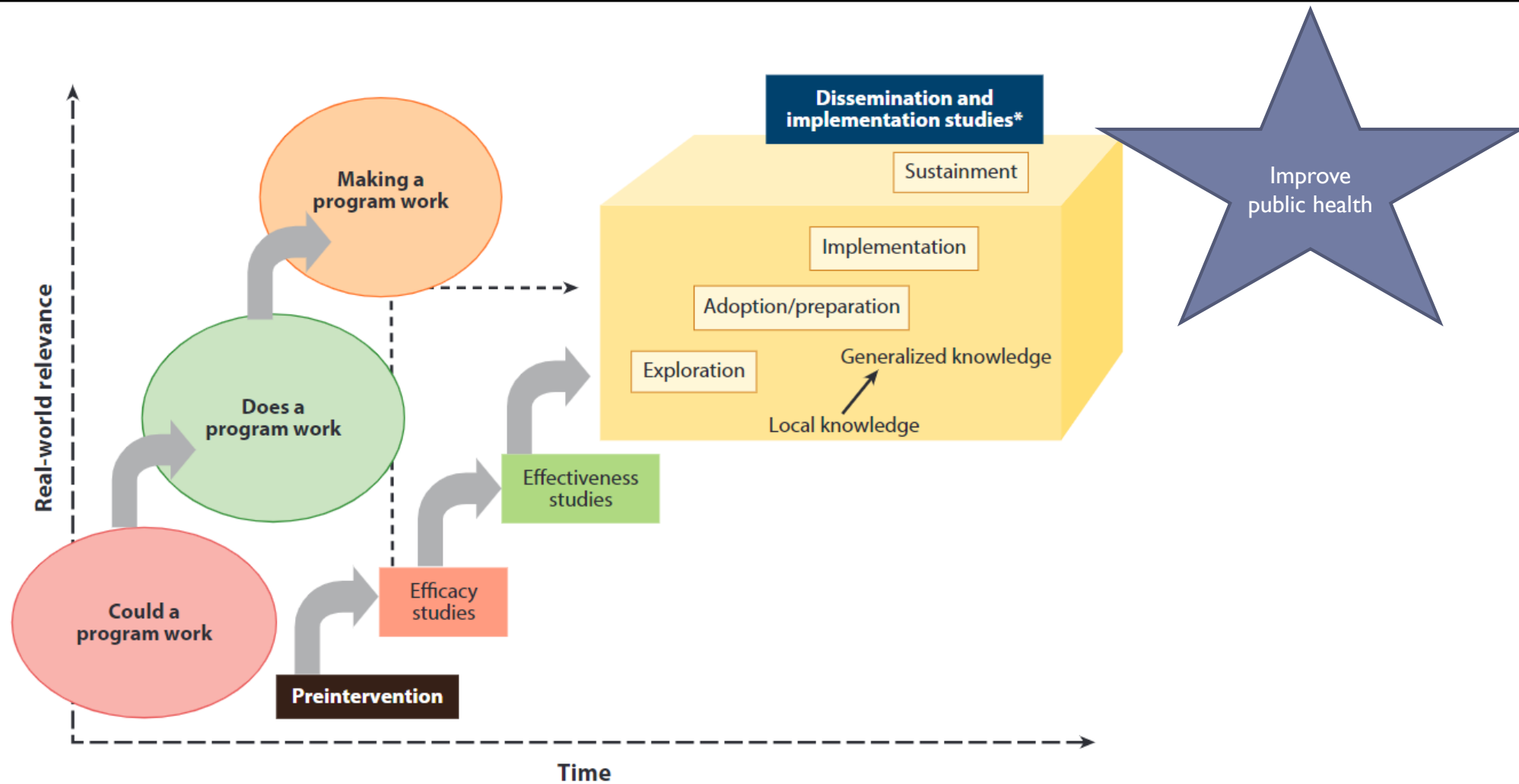


Diabetes Prevention Program Research Group. NEJM, 2002. 346(6): p. 393-403.

Aziz. Implementation Science 10.1 (2015): 172

Moin, American journal of preventive medicine 53.1 (2017): 70-77.

Ely. Diabetes Care 2017;40:1331-1341



*These dissemination and implementation stages include systematic monitoring, evaluation, and adaptation as required.

Figure 1

Traditional translational pipeline from preintervention, efficacy, effectiveness, and dissemination and implementation studies.

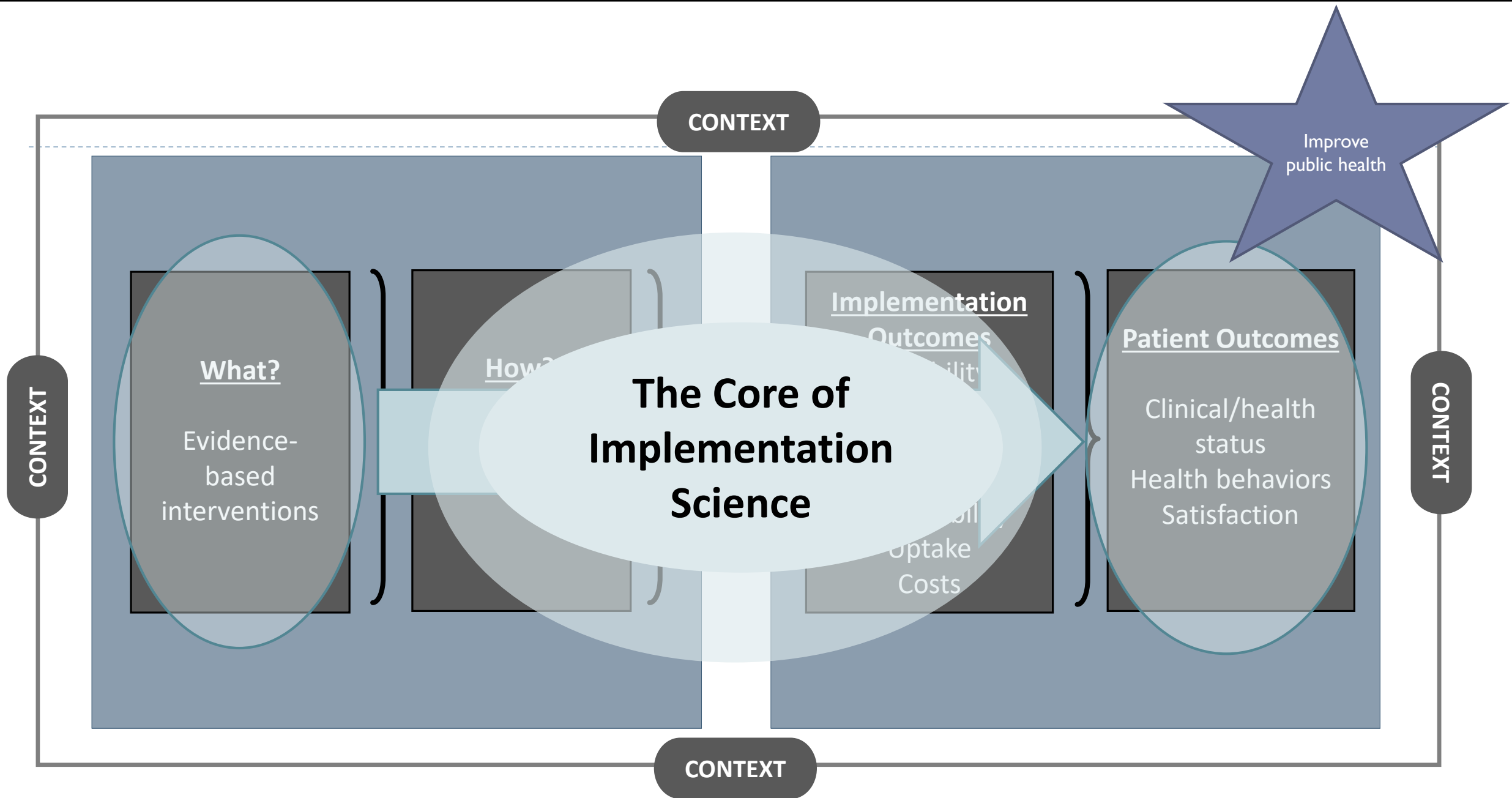


Fig. 1

From: [Implementation science made too simple: a teaching tool](#)

When defining implementation science, some very non-scientific language can be helpful...

- The intervention/practice/innovation is **THE THING**
- *Effectiveness* research looks at whether **THE THING** works
- *Implementation* research looks at how best to help people/places **DO THE THING**
- Implementation strategies are the stuff we do to try to help people/places **DO THE THING**
- Main implementation outcomes are **HOW MUCH** and **HOW WELL** they **DO THE THING**

Some key terms

- ▶ **Dissemination and implementation research** intends to bridge the gap between research, practice, and policy by building a knowledge base about how health information, effective interventions, and new clinical practices, guidelines, and policies are communicated and integrated for public health and health care service use in specific settings.
- ▶ **Dissemination research** is defined as the scientific study of the targeted distribution of information and intervention materials to a specific public health, clinical practice, or policy audience. The intent is to understand how best to communicate and integrate knowledge and the associated evidence-based interventions.
- ▶ **Implementation research** is defined as the scientific study of the use of strategies to adopt and integrate evidence-based health interventions into clinical and community settings to improve individual outcomes and benefit population health.

Term

Adaptation

Dissemination

Context

Hybrid designs

Facilitation

Innovation

Implementation strategy

Implementation research

Readiness

Scale-up

Stakeholders

Technical assistance

Implementation outcomes

Acceptability

Adoption

Appropriateness

Costs

Feasibility

Fidelity

Penetration

Sustainability

Definition

Process of changes to an innovation to increase suitability for a particular population or organization while keeping core components; may happen deliberately or passively

Targeted spread of information/interventions to a targeted audience

Setting in which implementation takes place; features of inner and outer setting that may affect implementation including, but not limited to, culture, organizational structure, local policy, leadership, capacity, networks, and environmental (in) stability⁸²

Research designs with dual focus on clinical effectiveness (ie, health outcomes) and implementation outcomes

Process whereby a designated person (facilitator) uses a set of implementation strategies differentially between sites in response to varying contextual needs and barriers; akin to current use of the term *technical assistance* in nutrition education and behavior, which has a different meaning in implementation science.

Program, practice, product, pill, policy, principle, or procedure that has shown to be effective through outcomes evaluation to some degree for some contexts

The "how-to" of changing practitioner or organizational behavior toward the goal of improving implementation outcomes

Scientific study of implementation that focuses on the how and why of successes and failures of innovations in real-world settings; goal is generalizable knowledge

Degree to which an individual or organization is prepared to implement change⁵⁸

Broadening the delivery of an innovation through deliberate efforts to reach a wider but similar audience and context compared with that in which the innovation was tested originally

Individuals or organizations affected by an implementation effort; can include community members or patients targeted by the effort and/or frontline practitioners delivering the innovation

Use of local or centralized personnel (eg, call-in help line) as needed to address issues with implementation; an implementation strategy

Definition

Practitioner or stakeholder satisfaction with elements of the innovation (eg, content, complexity).

Initial implementation or uptake of innovation by practitioner or organization.

Perceived fit; relevance; compatibility; usefulness for practitioner, stakeholder, or organization

Organizational resources to deliver innovation or implementation strategy(ies); cost-effectiveness or cost benefit to system

Suitability for everyday use by practitioner or organization given available resources.

Program delivery quality by practitioner; extent of delivery as intended

Degree of institutionalization and/or spread across organization

Organizational continuation of innovation; maintained integration into setting

Report

Implementation Science and Behavior: Opportunities for Integration

Taren Swindle PhD¹ ✉, Geoff M. Curran PhD²,

2 Swindle et al

Table 1. Implementation Outcomes

Term

Adaptation

000, Number 000, 2019

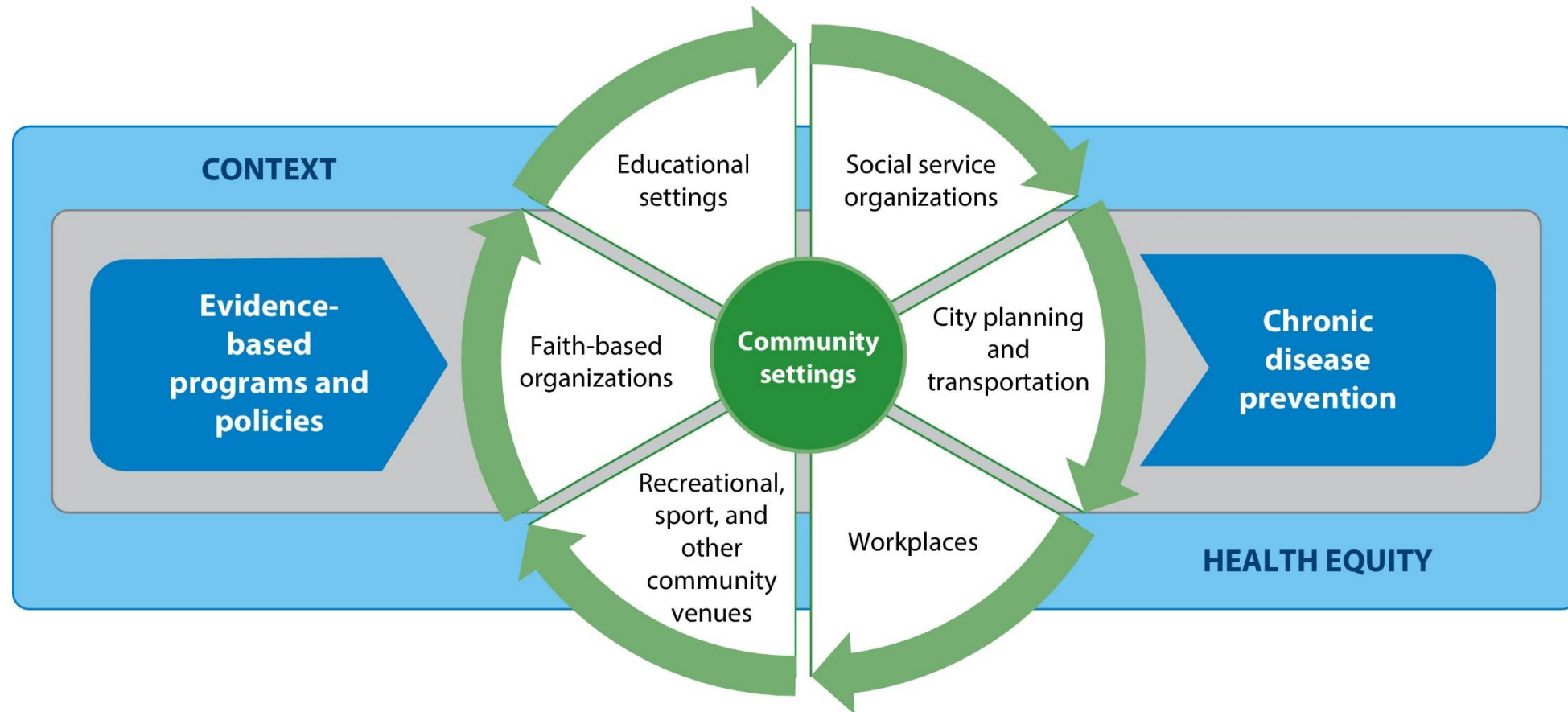
particular population
deliberately or

Note: This table was adapted and expanded from Proctor et al⁵⁰ and Livet et al.⁵²

Glasgow and Chambers 2012

- ▶ “We propose that the key goal of implementation science should be to study the
 - ▶ development, spread and sustainability of
 - ▶ broadly applicable and practical programs, treatments, guidelines, and policies
 - ▶ that are contextually relevant and robust
 - ▶ across diverse settings, delivery staff, and subgroups.”

Where does Public Health happen? How can D&I help?

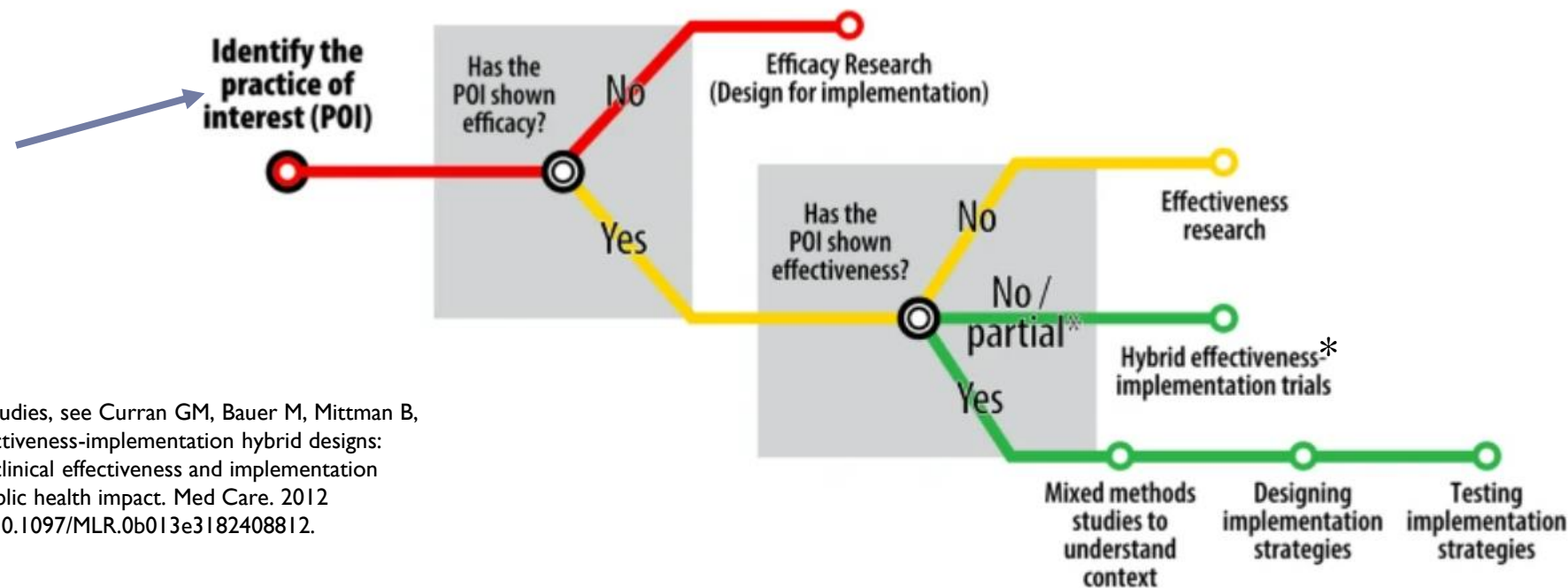


 Mazzucca S, et al. 2021
Annu. Rev. Public Health 42:135–58

Mazzucca, S., Arredondo, E. M., Hoelscher, D. M., Haire-Joshu, D., Tabak, R. G., Kumanyika, S. K., & Brownson, R. C. (2021). Expanding implementation research to prevent chronic diseases in community settings. *Annual review of public health*, 42, 135. <https://www.annualreviews.org/doi/10.1146/annurev-publhealth-090419-102547>

Where do your research questions fall in the translational research continuum?

Fig. 1



*For more on Hybrid studies, see Curran GM, Bauer M, Mittman B, Pyne JM, Stetler C. Effectiveness-implementation hybrid designs: combining elements of clinical effectiveness and implementation research to enhance public health impact. *Med Care*. 2012 Mar;50(3):217-26. doi: 10.1097/MLR.0b013e3182408812.

Graphic has been tested with colorblindness filters to ensure readability.

* In some cases it may be appropriate to move forward with a hybrid Type 1 trial in the absence of effectiveness evidence (e.g., very strong efficacy, indirect evidence supportive of potential effectiveness in context of interest, and/or strong momentum supporting implementation in a health care context).

“Subway” schematic to guide researchers contemplating implementation studies of evidence-based interventions

Discuss in pairs, briefly...

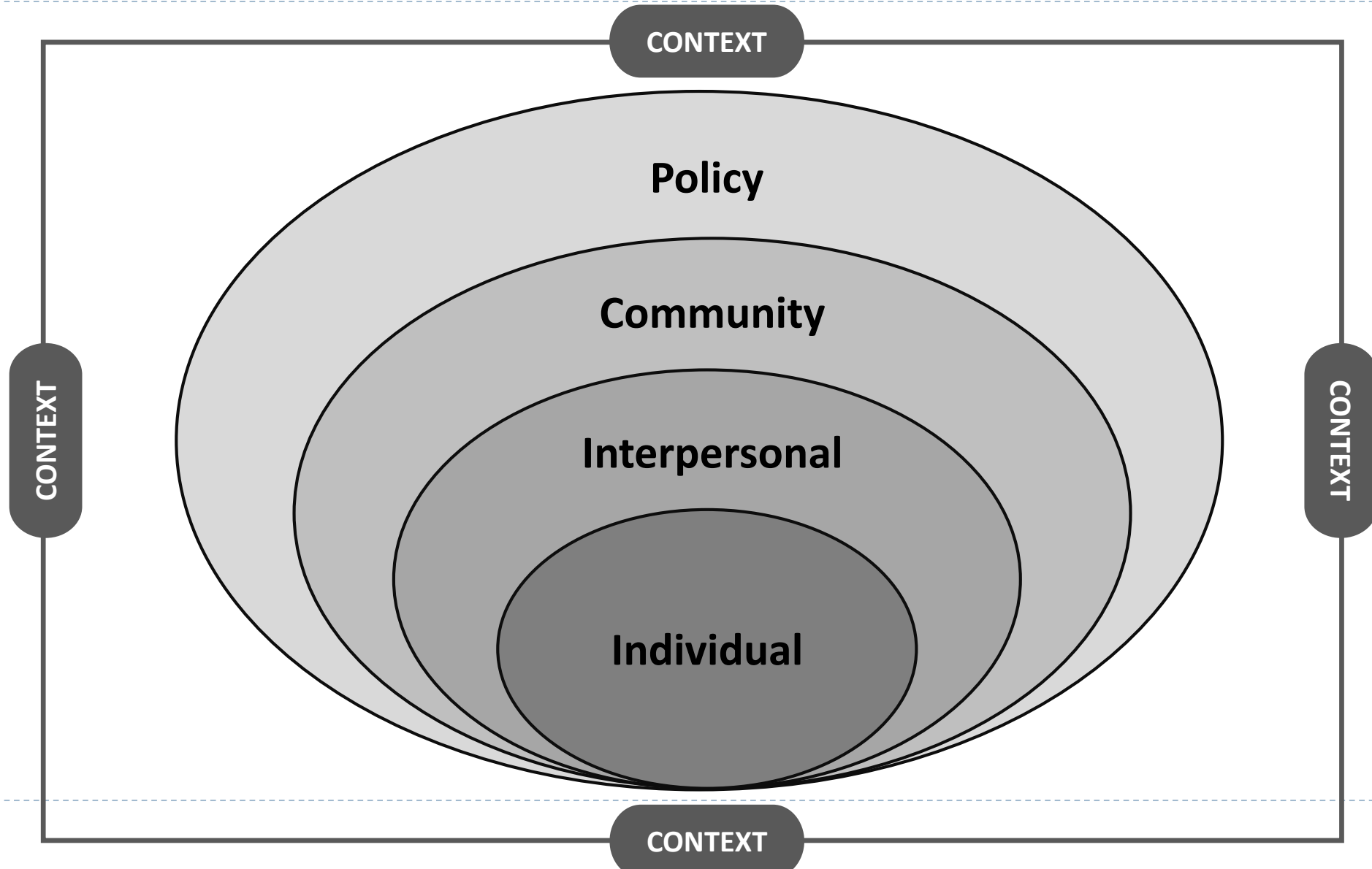
- ▶ In what ways do you hope your work will impact public health?
- ▶ How will you measure these impacts?
- ▶ Anyone willing to share?



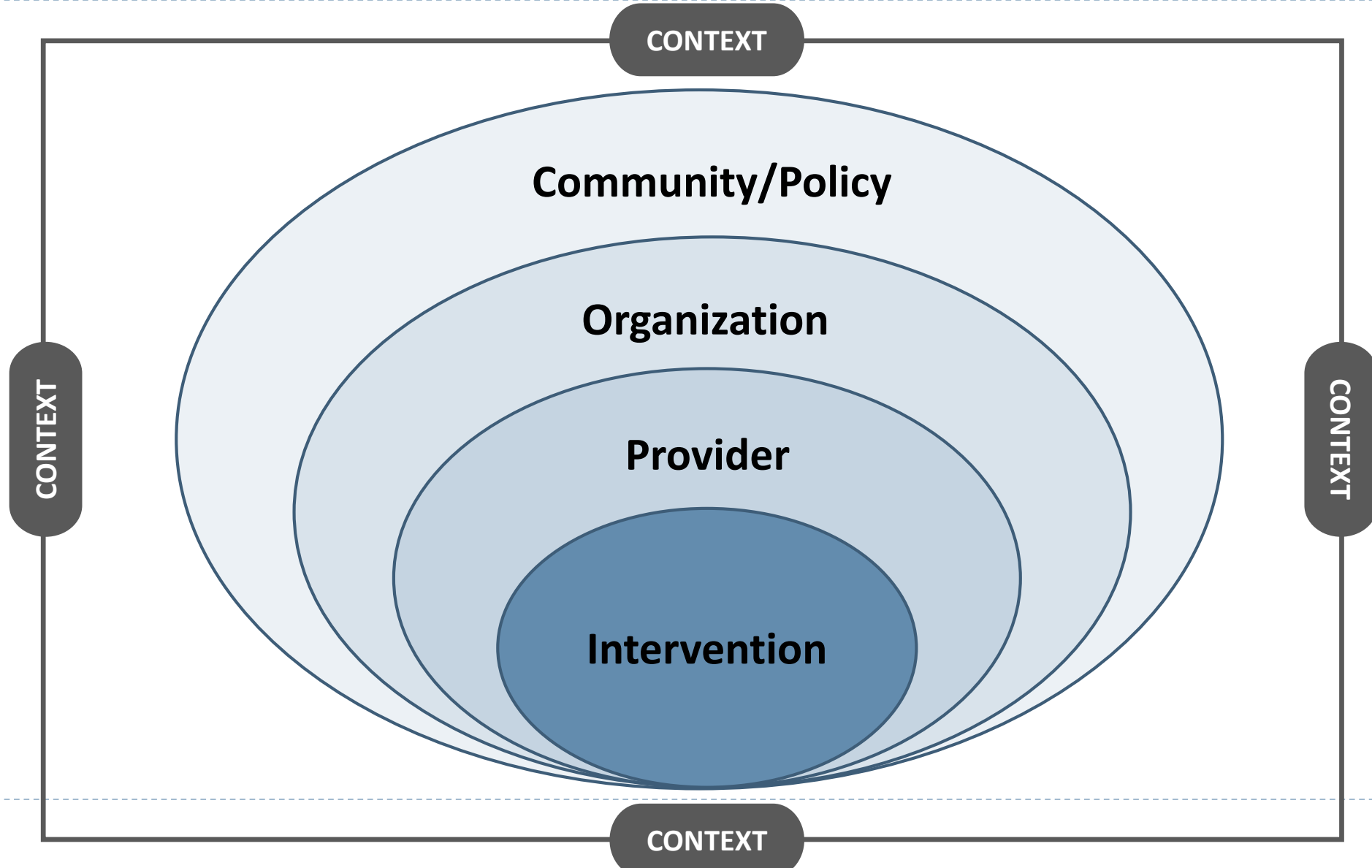
What is an implementation challenge
in your work?



Multiple-levels of Context



Multiple-levels of Context



RESEARCH

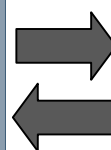
Open Access

CONTEXT A refined compilation of **implementation strategies:** results from the Expert Recommendations for Implementing Change (ERIC) project

Byron L Powell^{1*}, Thomas J Waltz², Matthew J Chinman^{3,4}, Laura J Damschroder⁵, Jeffrey L Smith⁶, Monica M Matthieu^{6,7}, Enola K Proctor⁸ and JoAnn E Kirchner^{6,9}

What?
Evidence-based interventions

How?
Implementation Strategies



Implementation Outcomes
Feasibility
Fidelity
Penetration
Acceptability
Sustainability
Uptake

Patient Outcomes
Clinical/health status
Health behaviors
Satisfaction

CONTEXT

Psychology and Health
Vol. 26, No. 11, November 2011, 1479–1498

 Routledge
Taylor & Francis Group

A refined taxonomy of **behaviour change techniques** to help people change their physical activity and healthy eating behaviours: The CALO-RE taxonomy

Susan Michie^{a*}, Stefanie Ashford^b, Falko F. Sniehotta^c, Stephan U. Dombrowski^d, Alex Bishop^b and David P. French^b



Report

Implementation Science and Nutrition Education and Behavior: Opportunities for Integration

Taren Swindle PhD¹ ✉, Geoff M. Curran PhD², Susan L. Johnson PhD³

Table 2. Clusters and Examples of Implementation Strategies Drawn From Expert Recommendations for Implementing Change Project

Cluster of Strategies	Example Strategy
Engage consumers	Use mass media; prepare consumers to be active participants
Use evaluative and iterative strategies	Audit and feedback; develop a formal implementation blueprint
Change infrastructure	Create or change credentialing and/or licensure standards; change physical structure/equipment
Adapt and tailor to the context	Promote adaptability; tailor strategies
Develop stakeholder interrelationships	Identify and prepare champions; build a coalition
Use financial strategies	Develop disincentives; use new payment schemes
Support practitioners	Remind practitioners; revise professional roles
Provide interactive assistance	Provide local technical assistance; provide supervision
Train and educate stakeholders	Use train-the-trainer strategies; develop educational materials

Note: This table was adapted from Powell et al⁴⁶ and, Waltz et al⁴⁷ of the Expert Recommendations for Implementing Change project. Definitions of the strategies can be found in the original sources.

Report
Implementation Science and Nutrition Education and Behavior: Opportunities for Integration

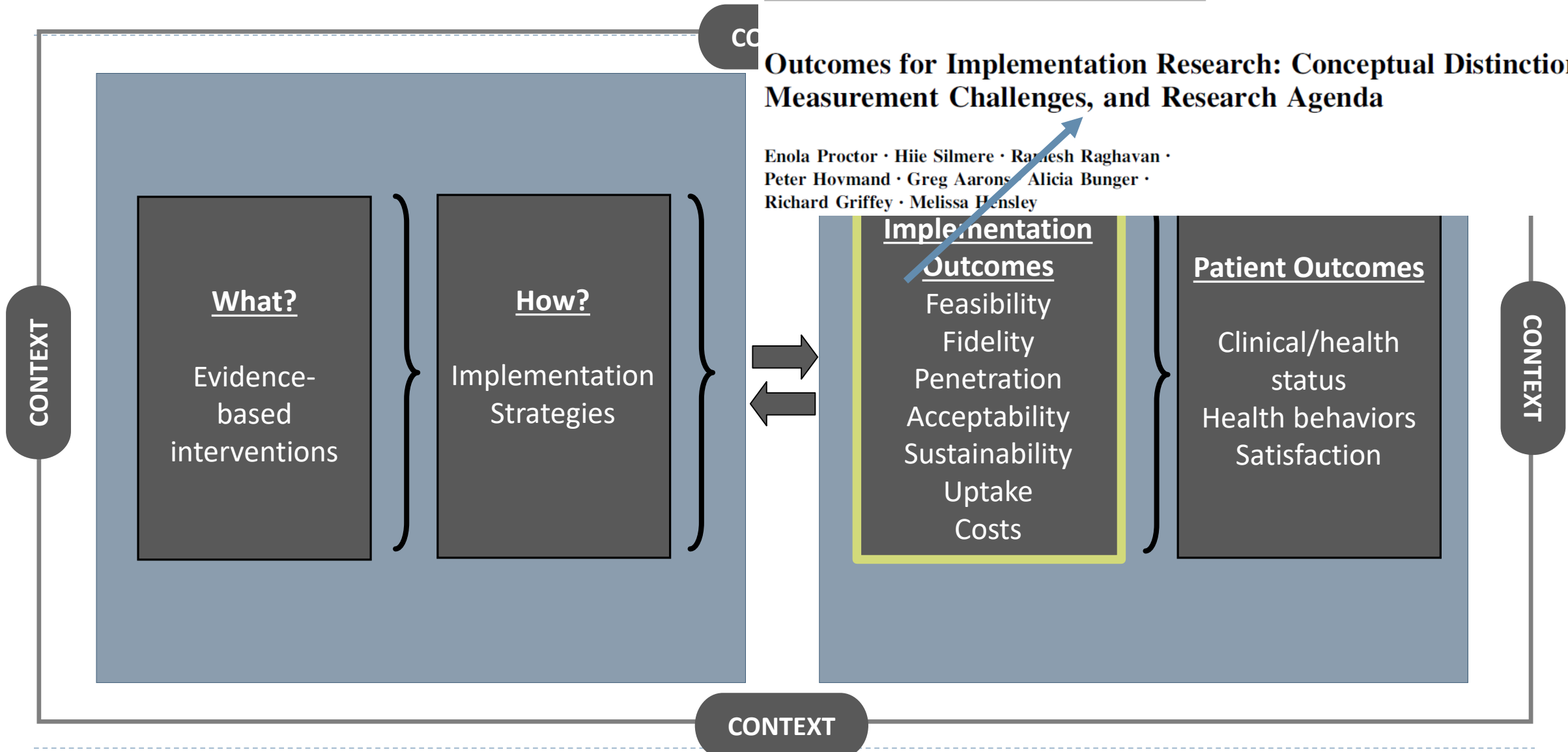
Taren Swindle PhD¹ ✉, Geoff M. Curran PhD², Susan L. Johnson PhD³

Table 3. Example of Strategy Specification to Support Implementation of Motivational Interviewing (MI)

Strategy	Strategy Cluster	Definition	Actors	Action	Temporality	Dose	Justification
Make training dynamic	Train and educate stakeholders	Interactive opportunities to practice and reflect	Experienced MI trainers	1-time workshop	1–2 wk before start of MI intervention	6 h	Provide foundational skills in MI
Send reminders	Support practitioners	Electronic reminders via e-mail	Automated by MI staff	Send reminders of key training messages.	Once per wk for 6 mo	Approximately 24 e-mails	Remind trainees by commonly used mode of communication
Provide audit and feedback	Use evaluative strategies	MI trainer watches recorded session of trainee and provides feedback	MI trainers	Identify strengths and weaknesses among new trainees	Twice within first 6 mo	1 h of feedback and coaching on each occasion (total of 2 h)	Providing tailored feedback in supportive environment to encourage further MI skill development

Outcomes for Implementation Research: Conceptual Distinctions, Measurement Challenges, and Research Agenda

Enola Proctor · Hiie Silmere · Ramesh Raghavan ·
Peter Hovmand · Greg Aarons · Alicia Bunger ·
Richard Griffey · Melissa Hensley



Theories, Models, and Frameworks in D&I Science

- ▶ D&I Models Webtool: <https://dissemination-implementation.org>
- ▶ T-CaST: Theory, Model, and Framework Comparison & Selection Tool: <https://impsci.tracs.unc.edu/tcast/>

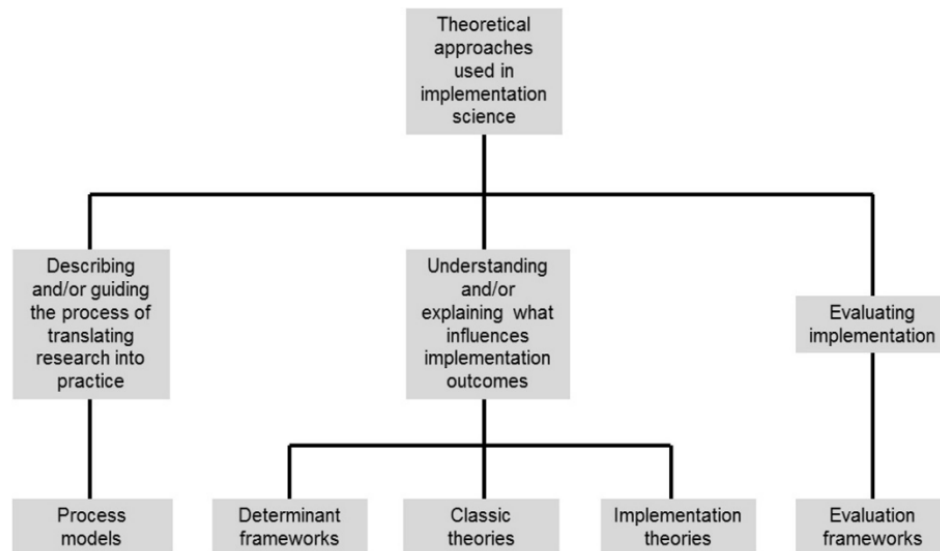


Figure 1 Three aims of the use of theoretical approaches in implementation science and the five categories of theories, models and frameworks.

Nilsen, P. Making sense of implementation theories, models and frameworks. *Implementation Sci* 10, 53 (2015). <https://doi.org/10.1186/s13012-015-0242-0>

Moullin, J.C., Dickson, K.S., Stadnick, N.A. *et al.* Ten recommendations for using implementation frameworks in research and practice. *Implement Sci Commun* 1, 42 (2020). <https://doi.org/10.1186/s43058-020-00023-7>

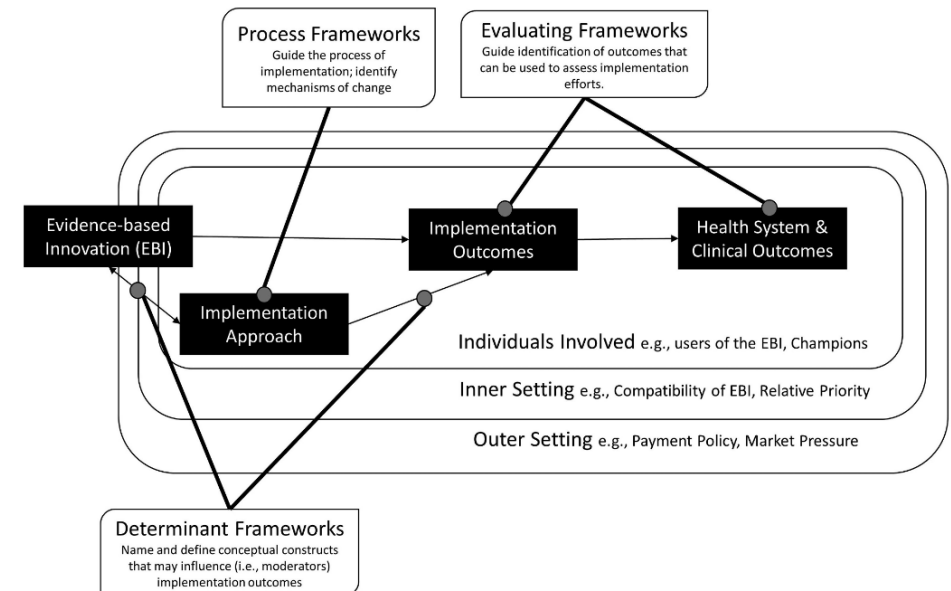


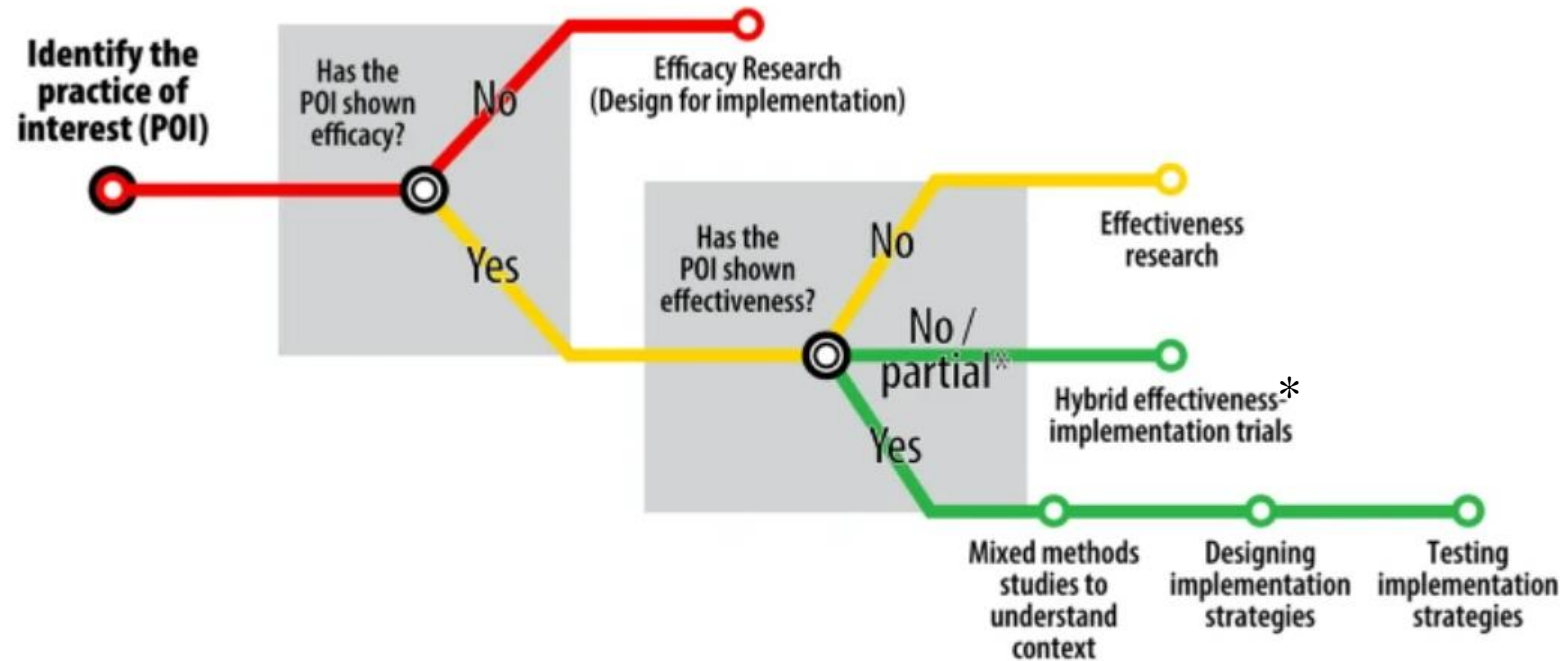
Fig. 1. Schematic showing foci of implementation science and links to 3 classes of theories.^a

^a Theories include frameworks, models, and generalized theories.

Damschroder, Laura J. "Clarity out of chaos: use of theory in implementation research." *Psychiatry research* 283 (2020): 112461.

Where do your research questions fall in the translational research continuum?

Fig. 1



Graphic has been tested with colorblindness filters to ensure readability.

* In some cases it may be appropriate to move forward with a hybrid Type 1 trial in the absence of effectiveness evidence (e.g., very strong efficacy, indirect evidence supportive of potential effectiveness in context of interest, and/or strong momentum supporting implementation in a health care context).

“Subway” schematic to guide researchers contemplating implementation studies of evidence-based interventions

Hybrid Studies

TABLE 2. Design Characteristics of Clinical Effectiveness and Implementation Trials (Ideal Types)

Design Characteristic	Clinical Effectiveness Trial	Implementation Trial
Test	“Clinical” intervention	Implementation intervention or strategy
Typical unit of randomization	Patient, clinical unit	Provider, clinical unit, or system
Typical unit of analysis	Patient	Provider, clinical unit, or system
Summative outcomes	Health outcomes; process/quality measures typically considered intermediate; costs	Adoption/uptake of the “clinical” intervention; process measures/quality measures typically considered outcomes

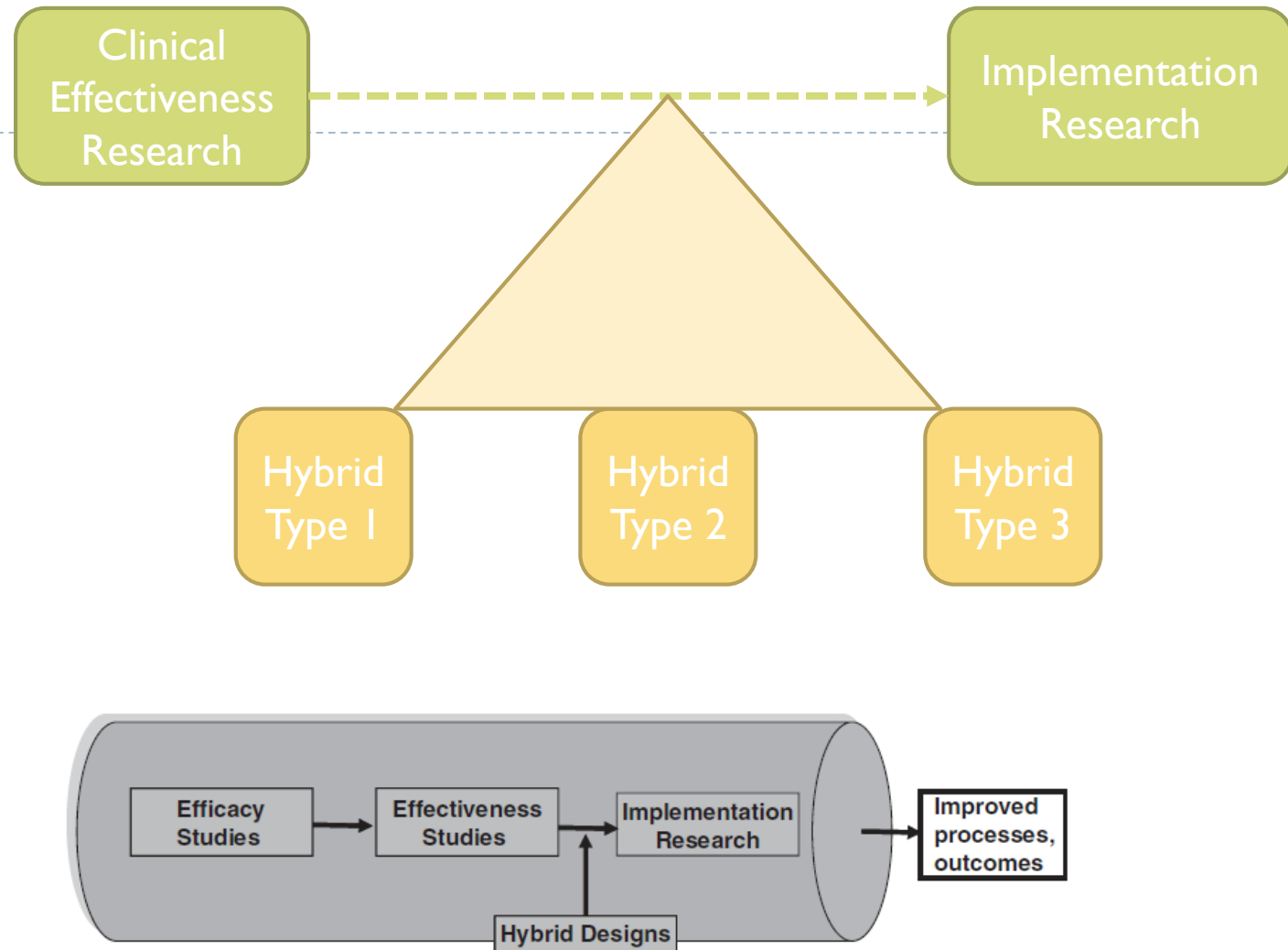


FIGURE 1. Research pipeline.

Curran GM, et al. Effectiveness-implementation hybrid designs: combining elements of clinical effectiveness and implementation research to enhance public health impact. *Med Care*. 2012 Mar;50(3):217-26. doi: 10.1097/MLR.0b013e3182408812

Adapted from: Landsverk J, Brown CH, Smith JD, et al. Design and Analysis in Dissemination and Implementation Research. In: Brownson RC, Colditz GA, Proctor EK, eds. *Dissemination and Implementation Research in Health: Translating Science to Practice*. 2nd ed. New York: Oxford University Press; 2017:201-227.

How can I incorporate D&I in my research agenda (and do I want to)?

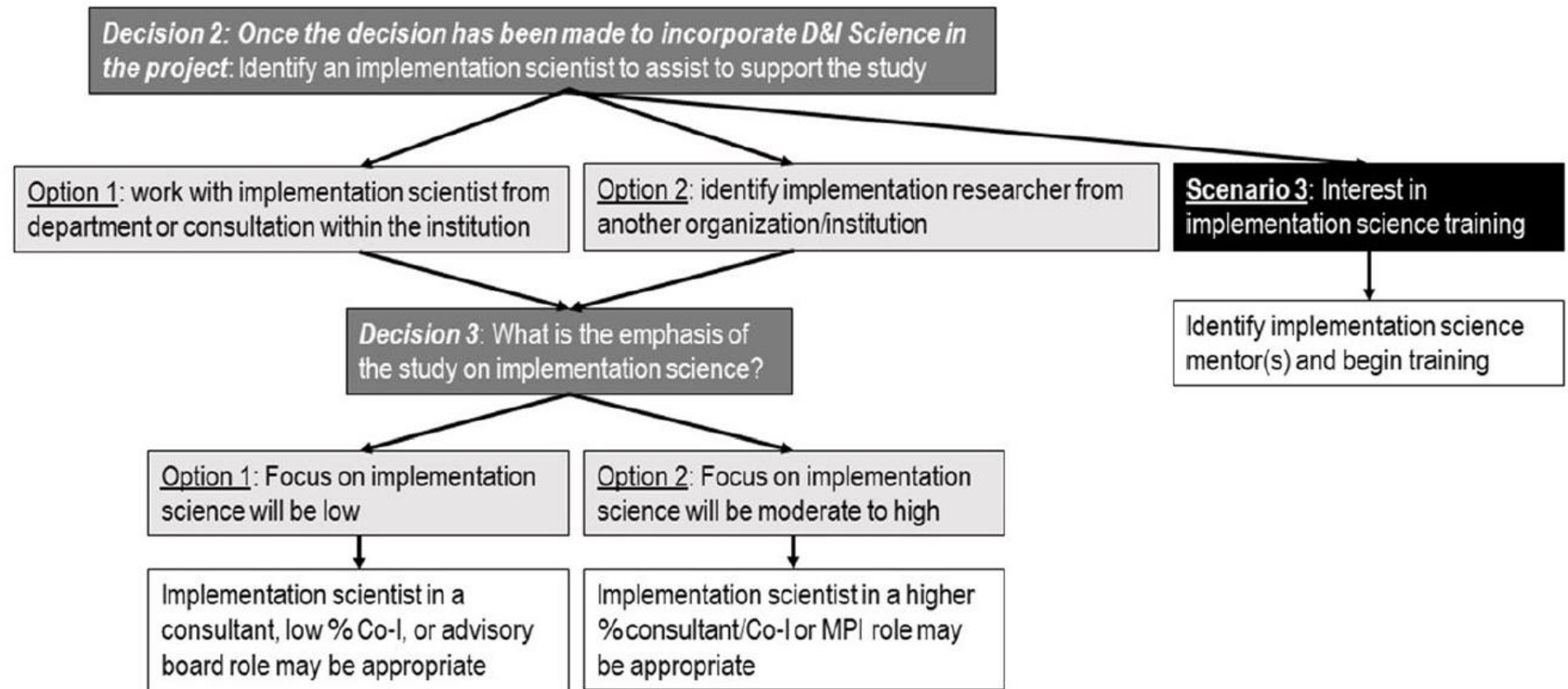


Fig. 1 Flow of decisions once the decision has been made to incorporate D&I Science in the project

Designing For Dissemination (D4D) Defined

- ▶ Set of processes that are considered and activities that are undertaken throughout the
 - ▶ **Planning**
 - ▶ **Development**
 - ▶ **Evaluation**
 - ▶ of an intervention to increase its D&I potential
- ▶ Understanding and consideration of the user context (receiver “pull”).

Designing for Dissemination and Sustainability to Promote Equitable Impacts on Health

Annual Review of Public Health

Vol. 43:331-353 (Volume publication date April 2022)

First published as a Review in Advance on January 4, 2022

<https://doi.org/10.1146/annurev-publhealth-052220-112457>

Bethany M. Kwan,¹ Ross C. Brownson,^{2,3} Russell E. Glasgow,¹ Elaine H. Morrato,⁴ and Douglas A. Luke⁵

Designing for dissemination and sustainability (D4DS)

Table 1. D4DS: Recommendations and answerable questions

Shifting ways of thinking: How to view the world from a D4DS perspective

Recommendation	Explanation	Action or answerable question
1: Begin with dissemination, sustainment, and equitable impact in mind	It is not enough to begin with anticipated health outcomes in mind—begin by asking, Who will influence the decision to adopt and sustain? How will this work ensure equitable impact?	To what extent do specific activities designed to enhance dissemination, sustainability, and equity yield improved health impacts?
2: Prioritize the needs and perspectives of diverse stakeholders at every stage of the process	Involving stakeholders from multiple perspectives, including potential adopters, will help anticipate challenges; keeping stakeholders involved throughout the process should improve quality of adaptations.	To what extent does ongoing involvement—in different ways and at multiple points in time—produce greater impact than more modest or one-time stakeholder engagement?
3: Appreciate the value of a rapid and iterative approach and the need for periodic adaptation	Anticipate and plan for the need to adapt programs or strategies in response to dynamic context over time.	In what ways do approaches that specifically include multiple assessment points for review of results to date and iterative adaptations yield enhanced impact?

Shifting skills and approaches: What we need to do differently to realize the promise of D4DS

Recommendation	Explanation	Action or answerable question
4: Incorporate team science and systems science principles and practices	D4DS is a collaborative enterprise and produces products that influence systems of care and health. Team and systems science best practices can help ensure that teams work well together and that they can produce better products.	To what extent do programs and products that incorporate team science and systems science methods produce greater impact?
5: Employ health communication techniques tailored to the intended audience	One size does not fit all, and framing how programs and products are discussed and promoted has a big impact on adoption.	Do products distributed to intended audiences using health communication and audience-targeted strategies produce greater adoption?
6: Evaluate adoption, equity, and sustainment at scale	Transparent reporting and rigorous evaluation of adoption, equity, and sustainment impacts and relationships among them using both randomized and nonrandomized designs are needed	To what extent can the field be advanced by investigations that provide full reporting on all three of these impacts rather than on health impacts only?

Shifting training and evaluation systems and infrastructure: What we need to build to support shifting views, skills, and approaches

Recommendation	Explanation	Action or answerable question
7: Establish and promote training programs that acculturate trainees to the D4DS perspective and teach D4DS skills	Training in key issues described in this article (e.g., communications training, systems science, user-centered design, in-depth training in stakeholder engagement) helps promote equity.	To what extent do training programs and activities that include key D4DS competencies produce better, more sustainable results than those that do not?
8: Provide resources to assist programs and policies that inform D4DS and develop practice-based evidence	The above recommendations require support and funding. Infrastructure is needed to accommodate emerging D4DS lessons learned.	To what extent do programs and trainings that provide targeted resources and specific responsibilities for D4DS and continuous evaluation produce more sustainable and equitable impacts?

So many to thank!

- ▶ Ross Brownson, Debra Haire-Joshu, Stephanie Mazzucca, Enola Proctor, Cindy Schwarz, Allie Phad, Dianne Ward, many more...
- ▶ Washington University Network for D&I Research (WUNDIR)





What do you think?

Questions?

Examples?



 UNC | RESEARCH

Using Implementation Science Theories, Models, and Frameworks to Improve Child Health: Go NAPSACC Kentucky

Dianne S Ward

September 18, 2022

Overview

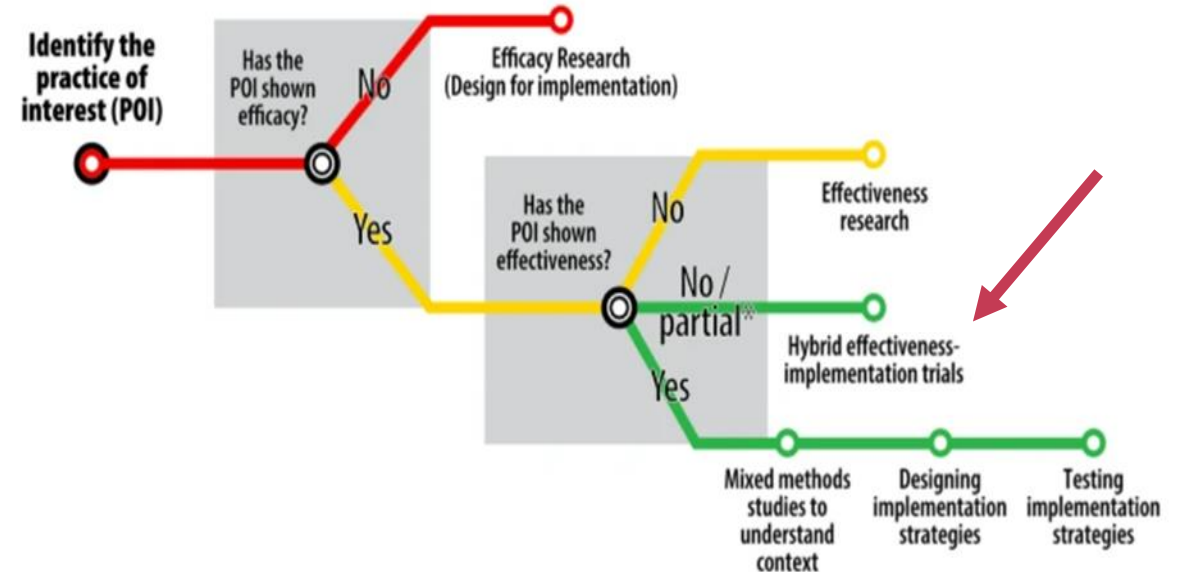
The Thing

- Go NAPSACC
- Using theory to study Go NAPSACC implementation

Do the Thing:

- Test GNS KY with research questions and research design
- Measure outcomes

Fig. 1



Graphic has been tested with colorblindness filters to ensure readability.

* In some cases it may be appropriate to move forward with a hybrid Type 1 trial in the absence of effectiveness evidence (e.g., very strong efficacy, indirect evidence supportive of potential effectiveness in context of interest, and/or strong momentum supporting implementation in a health care context).

“Subway” schematic to guide researchers contemplating implementation studies of evidence-based interventions



What is Go NAPSACC?

Go NAPSACC

PURPOSE

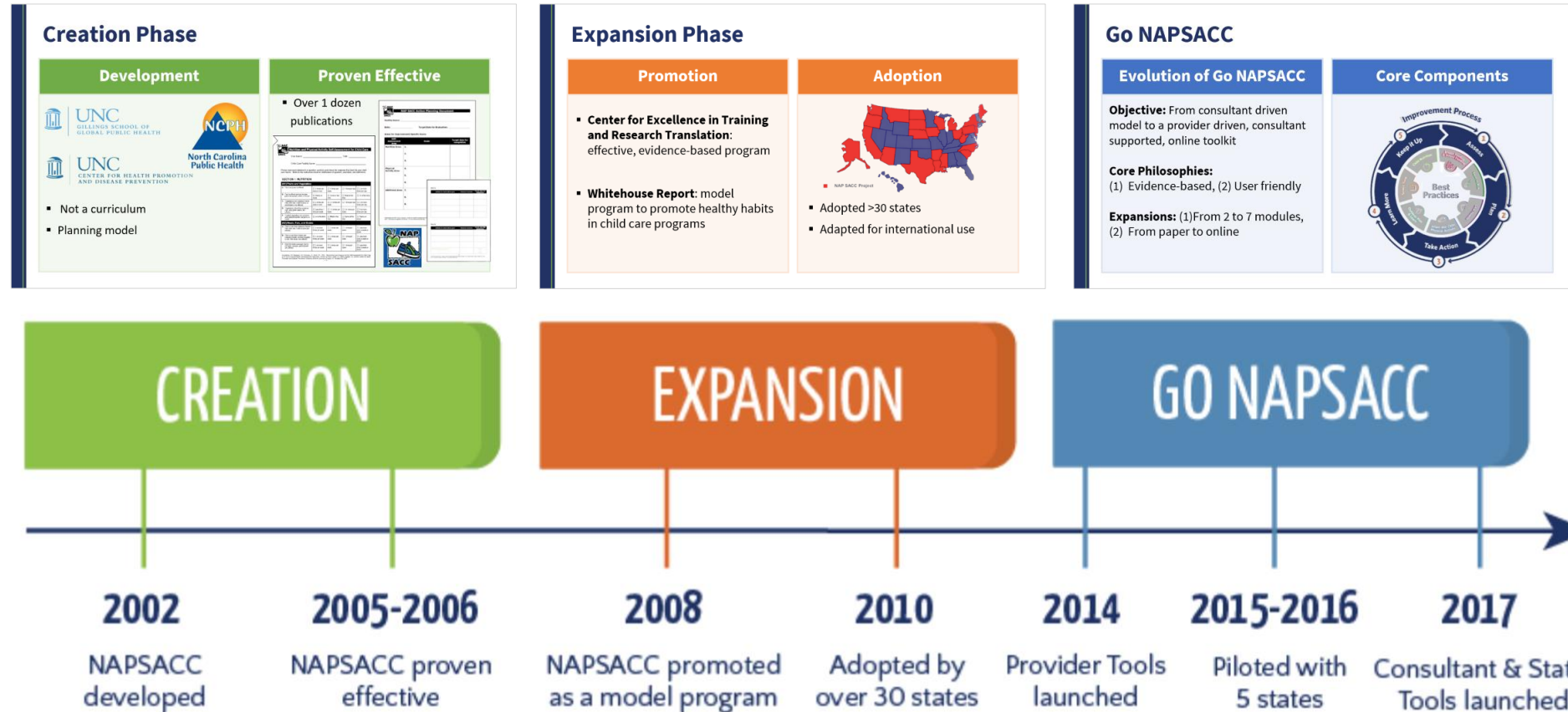
To support improvements to child care environments that foster healthy eating, physical activity, and overall development in children

- Focuses on installing evidence-based practices within the child care setting
- Works through consultants whose jobs include supporting child care quality
- Designed for dissemination (D4DS)

- Original NAPSACC = delivered to child care programs in person by NAPSACC Consultant using paper-based tools
- Go NAPSACC = translated tools into interactive online format, streamlined support required from NAPSACC Consultant



Our History



Creation Phase

Development



UNC
GILLINGS SCHOOL OF
GLOBAL PUBLIC HEALTH



North Carolina
Public Health



UNC
CENTER FOR HEALTH PROMOTION
AND DISEASE PREVENTION

Not a curriculum, but a planning model

Proven Effective

- Over 1 dozen publications

NAP SACC
Nutrition and Physical Activity Self-Assessment for Child Care

Your Name: _____ Date: _____
Child Care Facility Name: _____

Please read each statement or question carefully and check the response that best fits your child care facility. Refer to the instruction sheet for clarification of question, examples, and definitions.

SECTION I: NUTRITION

(N1) Fruits and Vegetables

A. Fruit (not juice) is offered.	<input type="checkbox"/> 3 times per week or less	<input type="checkbox"/> 4 times per week	<input type="checkbox"/> 1 time per day	<input type="checkbox"/> 2 or more times per day
B. Fruit is offered canned in own juice (see syrups, fruit, or frozen).	<input type="checkbox"/> Rarely or never	<input type="checkbox"/> Some of the time	<input type="checkbox"/> Most of the time	<input type="checkbox"/> All of the time
C. Vegetables (not including French fries, tater tots, french fries, or dried beans) are offered.	<input type="checkbox"/> 2 times per week or less	<input type="checkbox"/> 3-4 times per week	<input type="checkbox"/> 1 time per day	<input type="checkbox"/> 2 or more times per day
D. Vegetables, other than potatoes, corn, and green beans, are offered.	<input type="checkbox"/> Less than 1 time per week	<input type="checkbox"/> 1-2 times per week	<input type="checkbox"/> 3-4 times per week	<input type="checkbox"/> 1 or more times per day
E. Cooked vegetables are prepared with added most fat, margarine or butter.	<input type="checkbox"/> All of the time	<input type="checkbox"/> Most of the time	<input type="checkbox"/> Some of the time	<input type="checkbox"/> Rarely or never

(N2) Meats, Fats, and Grains

A. Fried or pre-fried potatoes (French fries, tater tots, french fries) are offered.	<input type="checkbox"/> 3 or more times per week	<input type="checkbox"/> 2 times per week	<input type="checkbox"/> 1 time per week	<input type="checkbox"/> Less than once a week or never
B. Fried or pre-fried chicken and breaded meats (chicken nuggets) or fish (fish sticks) are offered.	<input type="checkbox"/> 3 or more times per week	<input type="checkbox"/> 2 times per week	<input type="checkbox"/> 1 time per week	<input type="checkbox"/> Less than once a week or never
C. High fat meats (sausage, bacon, hot dogs, bologna, ground beef) are offered.	<input type="checkbox"/> 3 or more times per week	<input type="checkbox"/> 2 times per week	<input type="checkbox"/> 1 time per week	<input type="checkbox"/> Less than once a week or never

Anderson, A.S., Bauman, S.B., Sommers, J.K., Ward, D.S., 2004. The Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC) environmental self-assessment instrument. Division of Public Health, NC DHHS, Raleigh, NC, and the Center for Health Promotion and Disease Prevention, University of North Carolina at Chapel Hill. Revised May 2007.

NAP SACC
NAP SACC Action Planning Document

Facility Name: _____
Date: _____ Target Date for Evaluation: _____

Areas for Improvement/Specific Goals:

Self-Assessment Area	Goals	Target date for completion
Nutrition Area:	1.	
	2.	
	3.	
Physical Activity Area:	4.	
	5.	
	6.	
Additional Area:	7.	
	8.	
	9.	

Goal 1:
Address to reach above goal: _____ Response received: _____ Target date for completion: _____

Goal 2:
Address to reach above goal: _____ Response received: _____ Target date for completion: _____

NAP SACC

Used D4DS Principles

1. Started thinking early about how this “thing” might function in practice
2. Developed as partnership between academic department and public health
3. Included multiple stakeholders (early childhood, child care, public health, and others) from the beginning

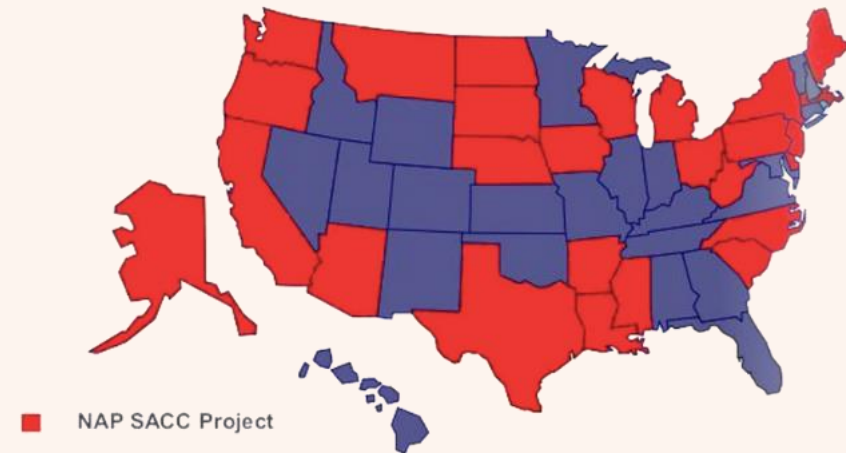


Expansion Phase

Promotion

- **Center for Excellence in Training and Research Translation:** effective, evidence-based program
- **White House Report:** model program to promote healthy habits in child care programs
- **CHOICES Project:** best evidence of impact on early childhood obesity risk

Adoption



- Adopted >30 states
- Adapted for international use



Used D4DS Principles

1. Started thinking early about how this “thing” might function in practice
2. Developed as partnership between academic department and public health
3. Included multiple stakeholders (early childhood, child care, public health, and others) from the beginning
4. Identified the system of child care – how it operates- in order to fit our “thing” into that universe
5. Used communication strategies that were tailored to this audience



Go NAPSACC

Evolution of Go NAPSACC

Objective: From consultant driven model to a provider driven, consultant supported, online toolkit

Core Philosophies:

(1) Evidence-based, (2) User friendly

Expansions: (1) From 2 to 7 modules, (2) From paper to online

Core Components



Used D4DS Principles

1. Started thinking early about how this “thing” might function in practice
2. Developed as partnership between academic department and public health
3. Included multiple stakeholders (early childhood, child care, public health, and others) from the beginning
4. Identified the system of child care – how it operates- in order to fit our “thing” into that universe
5. Used communication strategies that were tailored to this audience
6. Incorporated team & system science into principles/practices



Go NAPSACC's Core Components

5-STEP IMPROVEMENT PROCESS



Go NAPSACC's
Core
Components
Evidence-Based
BEST PRACTICES



Physical Activity Example

BEST PRACTICE SECTIONS

1. Time Provided
2. Indoor Play Environment
3. Teacher Practices
4. Education & Professional Development
5. Policy



EXAMPLES

“Preschool children are provided 120 minutes or more for indoor and outdoor physical activity each day.”

“A large variety of portable play equipment is available and in good condition for children to use indoors.”

“Teachers incorporate physical activity into classroom routines, transitions, and planned activities.”



Common Barriers to Implementation

- Variation in background/experience of Consultants
- Unable to convert child care programs to active users
- Lack of adherence to full 5-step improvement process
- Lack of director motivation
- Lack of engagement of child care staff
- Turnover in program management
- Lack of opportunities for peer learning to share ideas
- Lack of funding



Considered Options for Next Steps

- Tabak et al. (2012) Bridging Research and Practice: Models for Dissemination and Implementation Research. *Am J Prev Med*.
 - Identify theories and frameworks commonly used in dissemination and implementation research
 - 61 models identified
- Nilsen (2015) Making Sense of Implementation Theories, Models and Frameworks. *Implem Sci*.
 - Purpose/use of theories?
 - How should we implement the innovation?
 - What will influence the success of implementation?
 - How do we evaluate implementation success?



What Influences Implementation

What contextual factors may be barriers or facilitators to Go NAPSACC implementation?

Consolidated Framework for Implementation Research (CFIR)*

- Outer setting
- **Inner setting**
- **Individuals involved**
- Innovation characteristics
- Implementation process

*Damschroder et al. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci.* 2009; 4(1):50

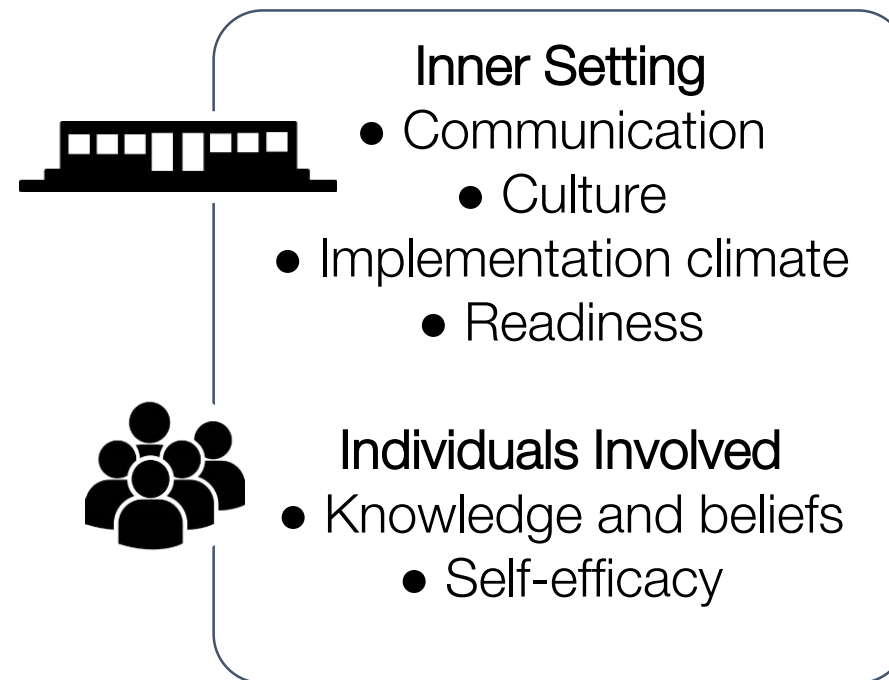


What Influences Implementation

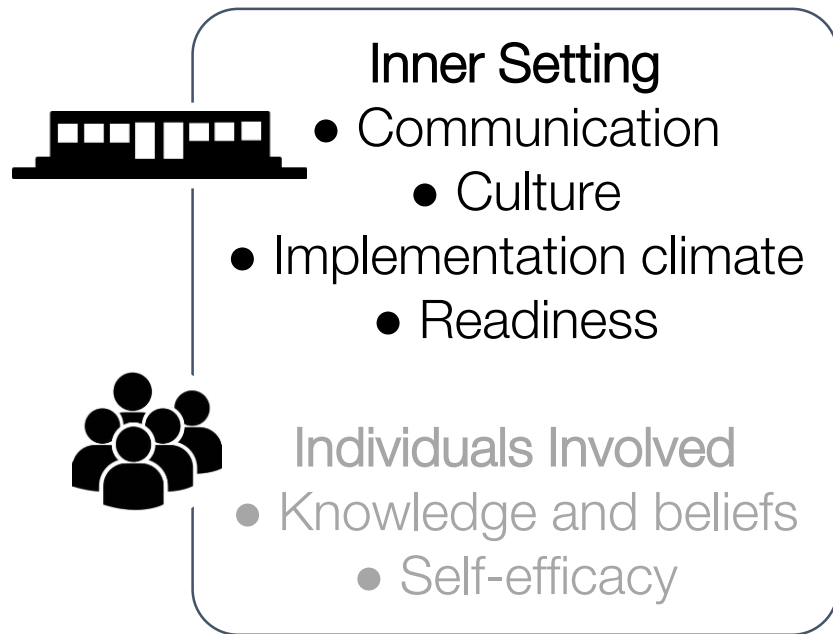
What contextual factors may be barriers or facilitators to Go NAPSACC implementation?

Consolidated Framework for Implementation Research (CFIR)

- Outer setting
- **Inner setting**
- **Individuals involved**
- Innovation characteristics
- Implementation process



Consolidated Framework for Implementation Research



Culture

- People can rely on others to do their jobs well.
- People show signs of stress and strain.
- People give effort toward doing a good job.

Communication

- Staff feel free to express concerns or ask questions.
- Directors listen to staff ideas and suggestions.
- Staff kept informed

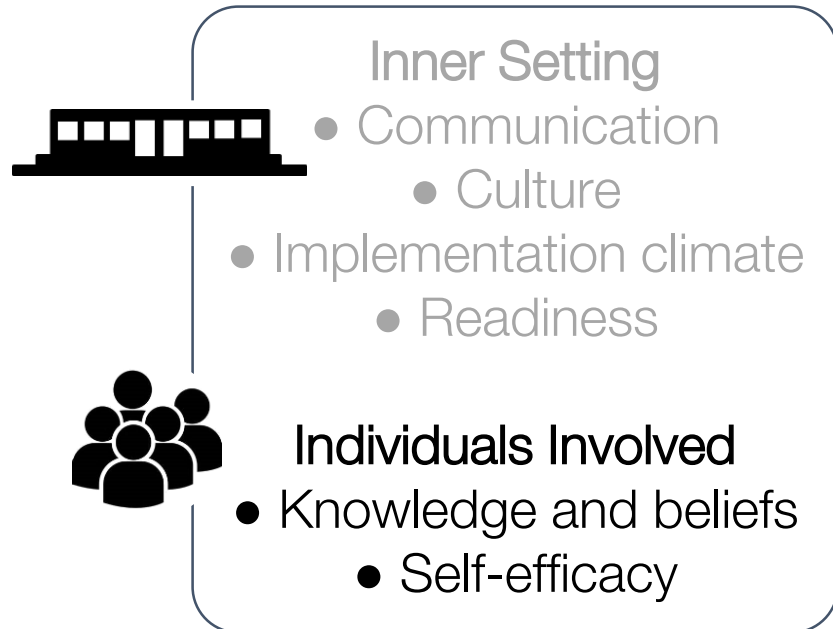
Readiness

- Staff are ready for implementation
- An environment exists to accomplish things
- Director is prepared to improve center practices

Implementation Climate

- Supporting children's PA is a high priority
- Staff recognized when do a good job
- Staff expected to use practices that support PA

Consolidated Framework for Implementation Research



Knowledge & Beliefs

- Staff believe following policies will benefit children
- Staff feel they know how to support adoption of PA practices

Self-Efficacy

- Director feels the center can adopt practices when staff are not receptive
- Staff feel personal control over adoption of new policies
- Staff feel promoting children's PA is easy

How to Implement

How do we improve Go NAPSACC implementation to address common barriers?

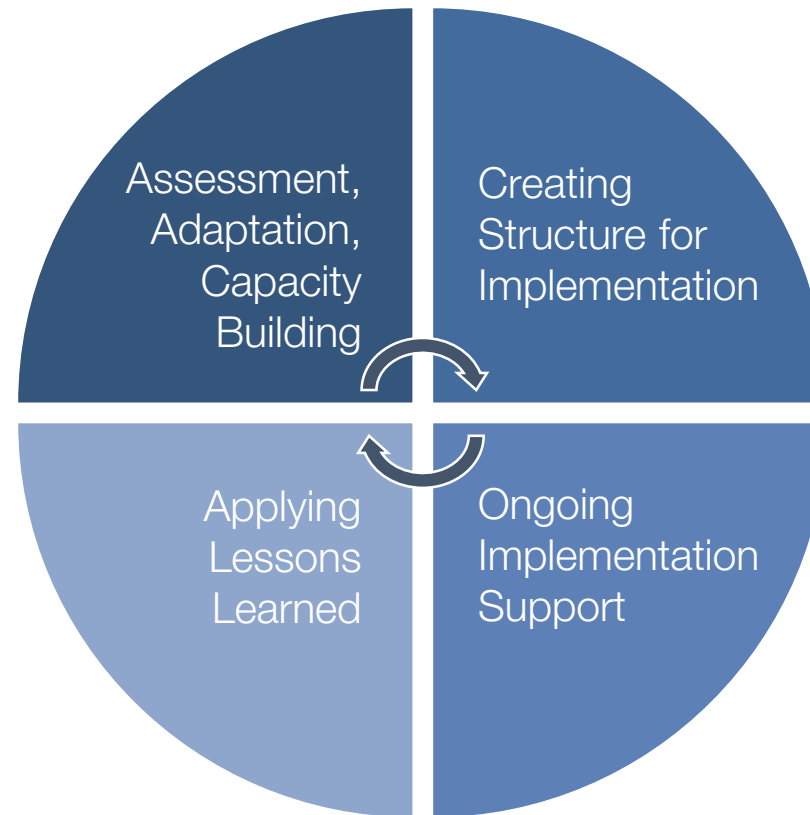
Quality Implementation Framework (QIF)* developed by:

- Conducting a synthesis of implementation literature
- Defining critical steps for high-quality implementation
- Using a 4-phase process

*Meyers DC, Durlak JA, Wandersman A., Am J Community Psychol. 2012 Dec;50(3-4):462-80.



Quality Implementation Framework



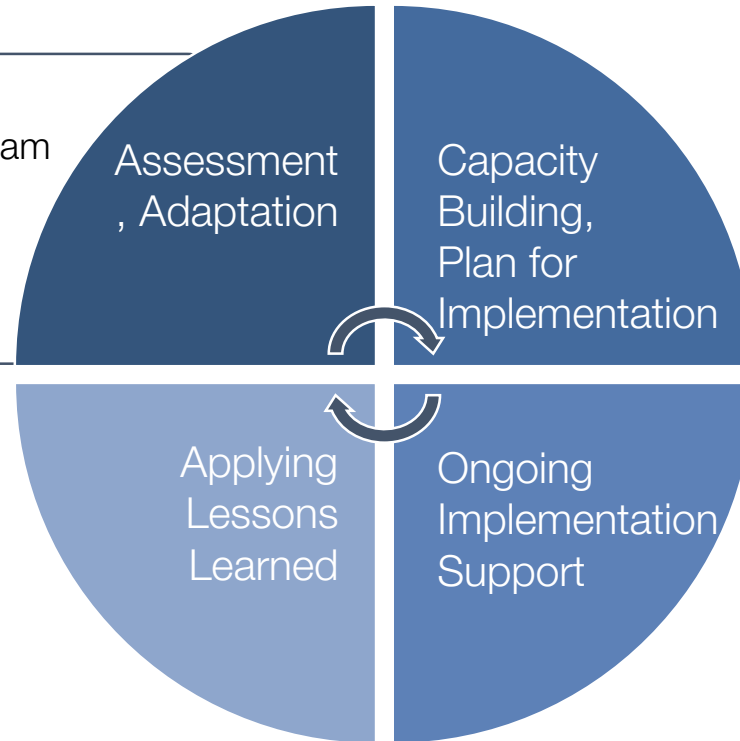
Meyers et al. 2012. Four phases of the QIF



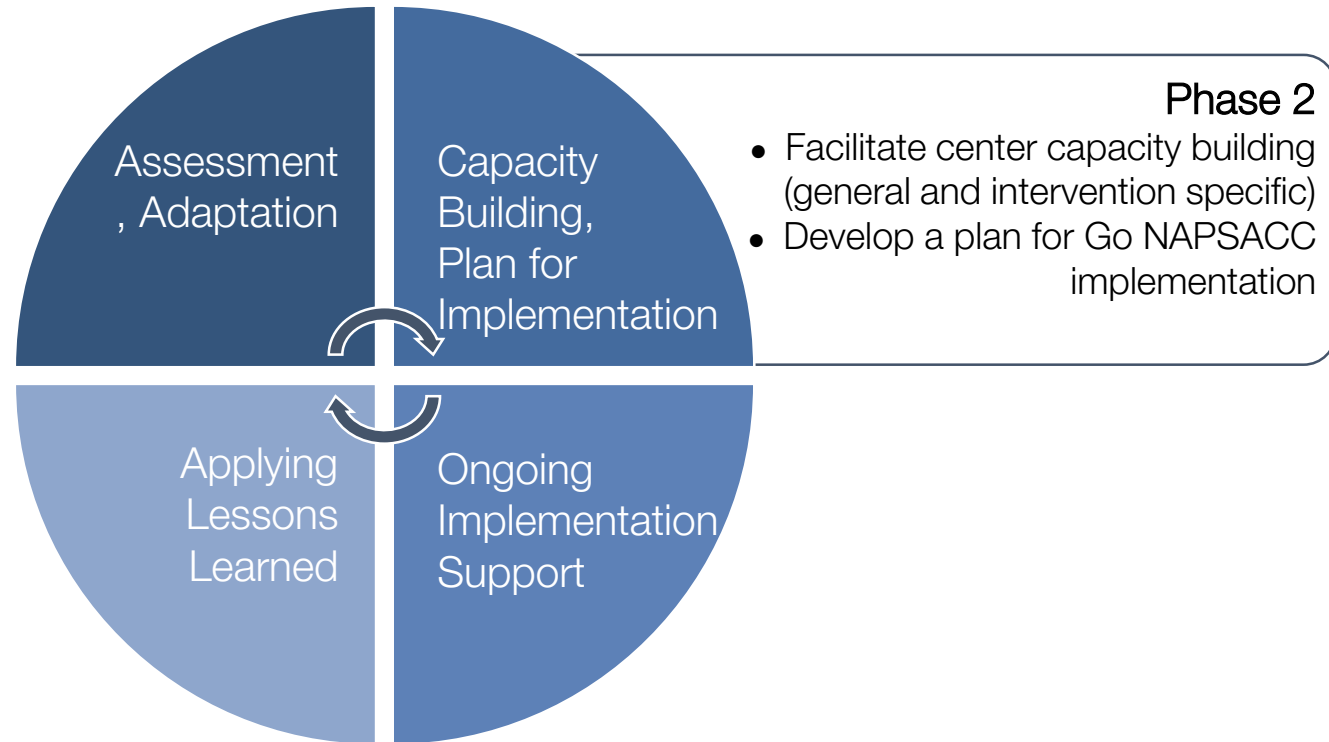
Quality Implementation Framework

Phase 1

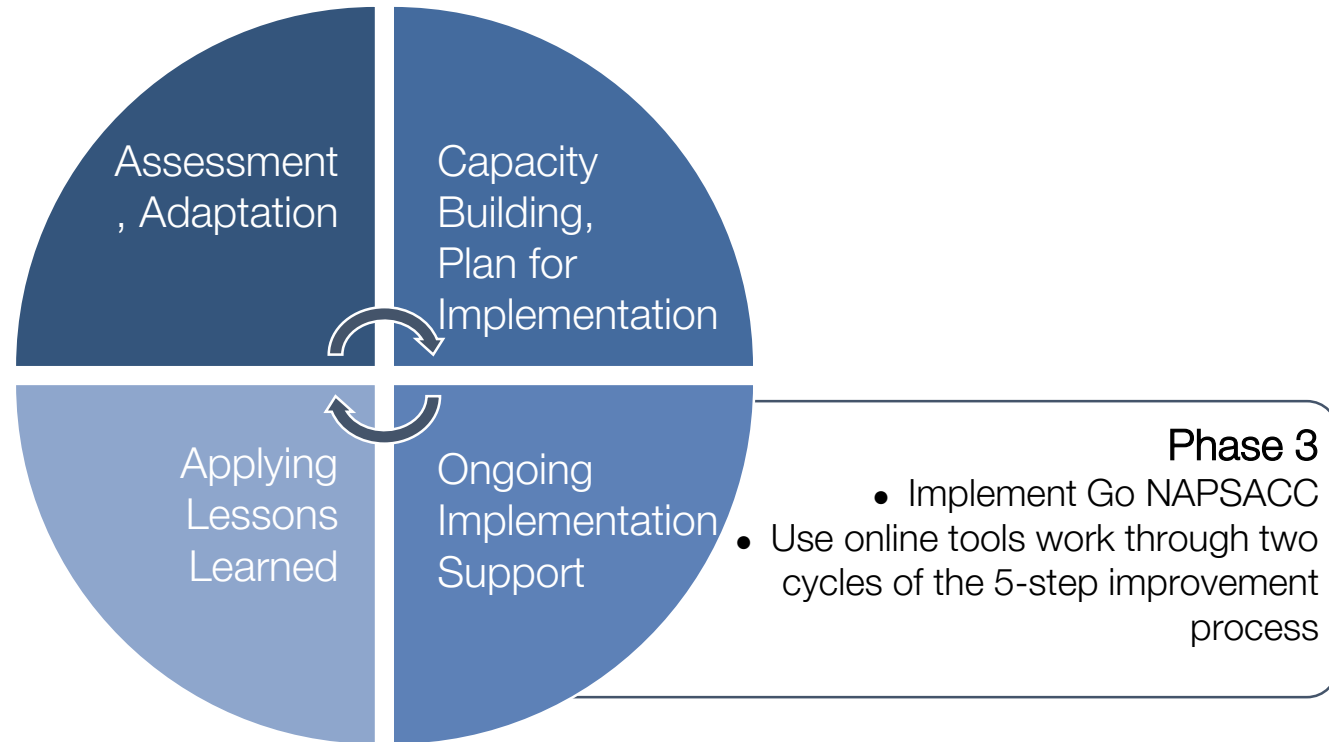
- Identify staff for implementation team
- Assess needs, fit, and capacity/ readiness
- Identify needed adaptations



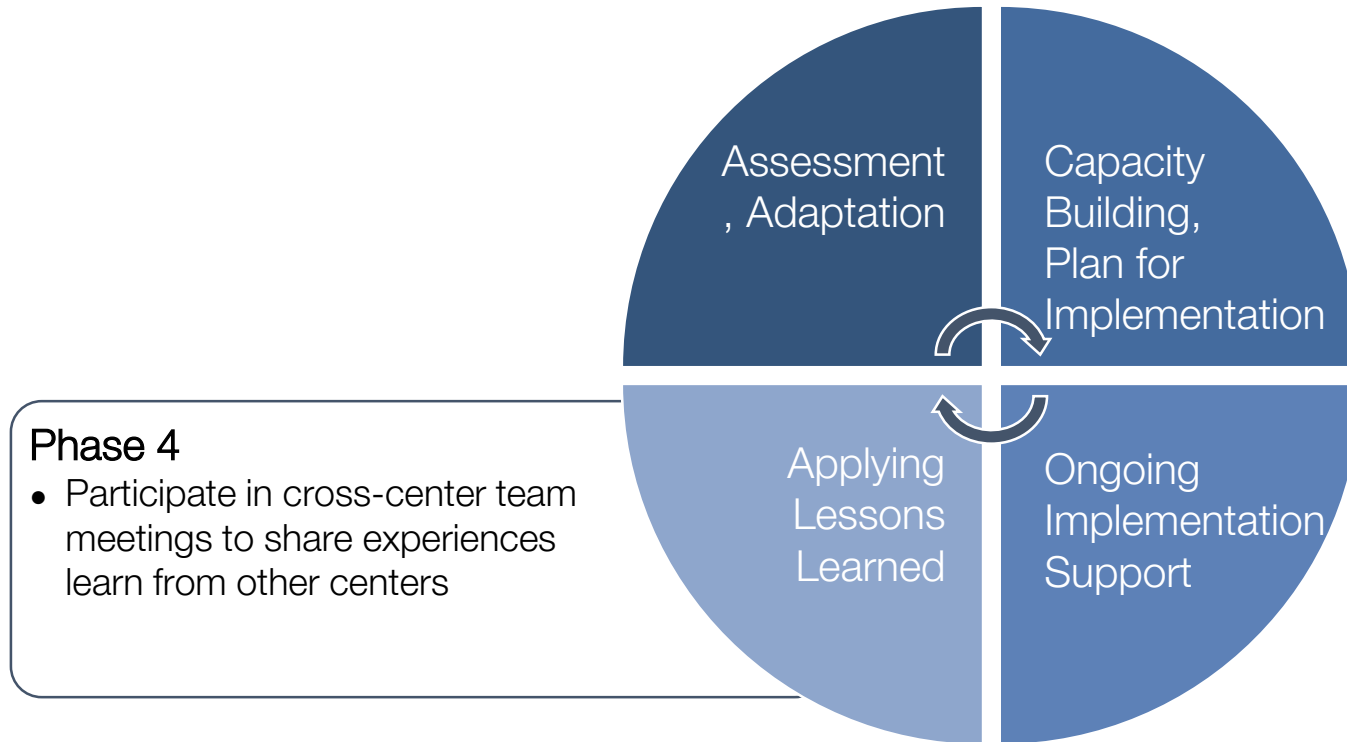
Quality Implementation Framework



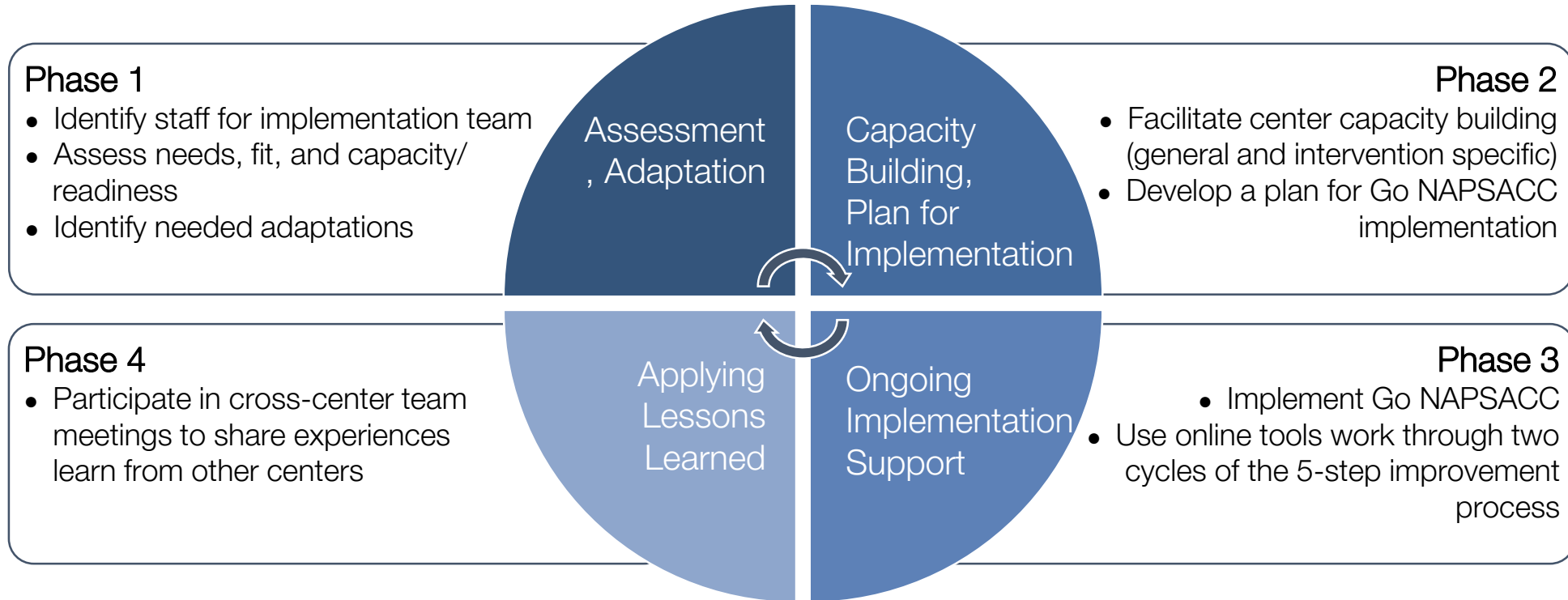
Quality Implementation Framework



Quality Implementation Framework



Quality Implementation Framework



Basic vs Enhanced Go NAPSACC

Basic Go NAPSACC

Basic Implementation

- Go NAPSACC orientation

- Use of Go NAPSACC online tools
 - Complete 2 cycles of the 5-step process
- 12 monthly check-ins with TA provider

Enhanced Go

Enhanced Implementation

Phase 1

- Identify implementation team
- Conduct needs assessment
- Review results, prioritize capacity needs
- Identify necessary adaptations

Phase 2

- Tailored workshop
 - General- and intervention-specific capacity building
- Go NAPSACC orientation*
- Plan for Go NAPSACC implementation

Phase 3

- Use Go NAPSACC online tools*
 - Complete 3 cycles of the 5-step process*
- 12 monthly check-ins with TA provider*

Phase 4

- 2-3 meetings between Implementation Teams within the region

12 months

Research Questions and Design

Key Research Questions

1. Does Enhanced Go NAPSACC increase centers' implementation of evidence-based practice more than Basic Go NAPSACC?
2. Does Enhanced Go NAPSACC improve centers' adoption of Go NAPSACC use of its 5-step improvement process?
3. How do contextual factors at child care centers (and community) impact Go NAPSACC implementation?
4. What is the incremental cost effectiveness of Enhanced Go NAPSACC compared to Basic Go NAPSACC?
5. Does Enhanced Go NAPSACC improve children's diet and physical activity behaviors more than Basic Go NAPSACC?



Study Design

- Type 2 hybrid effectiveness-implementation trial with a cluster-randomized design.
- Participants:
 - 18 Child Care Aware Coaches (TA consultants)
 - 97 Child Care Centers, 1 director and 1 teacher from each
 - 485 Children, about 5 per center, 3-4 years old, at two timepoints
- Coaches randomized following baseline data collection
 - 1:1 in either Basic Go NAPSACC or Enhanced Go NAPSACC
- Implement Basic or Enhanced Go NAPSACC for 12 months



How to Evaluate Implementation

How do we identify and evaluate important implementation outcomes?

RE-AIM

- Adoption
- Implementation fidelity
- Maintenance



Implementation Outcomes

- Centers' implementation of evidence-based nutrition and physical activity practices (assessed via EPAO instrument)
- Centers' successful completion of key steps of Go NAPSACC participation (assessed via website use)
 0. Registration
 1. Self-assessment
 2. Setting goals and creating action plans
 3. Completing action plans
 4. Completing trainings
 5. Repeating the self-assessment



Implementation Outcomes (cont.)

- Coaches' (TA consultant) successful delivery of key components of implementation approach—either Basic or Enhanced (assessed via TA Activity log on website)
- Centers' directors/teachers and coaches' perspectives of the implementation context (assessed via survey)
- Cost of implementation from the perspective of Child Care Aware, the agency responsible for providing TA consultants to child care in KY



Wrapping Up

Designed an effective innovation (“the thing”) built on D4DS principles

Developed a Type 2 hybrid effectiveness-implementation trial based on identified barriers

Used CFIR to target inner setting and individuals; used the Quality Implementation Framework to implement.

Results (implementation and health) being collected; available next year.



Research Team & Funding

- PI: Dianne S. Ward
- Co-Investigators: Alice Ammerman (UNC), Derek Hales (UNC), Courtney Luecking (KY), Justin Trogden (UNC)
- Consultants: Geoff Curran (University of Arkansas), Christina Studts (UCO-Denver)
- Project Managers: Regan Burney (UNC), Reginia Lewis (KY)
- Community Partners: Child Care Aware of Kentucky, Kentucky Department for Public Health
- NHLBI, R01HL137929 – Go NAPSACC Ky study
- CDC, U48DP005017 – UNC Center for Health Promotion and Disease Prevention

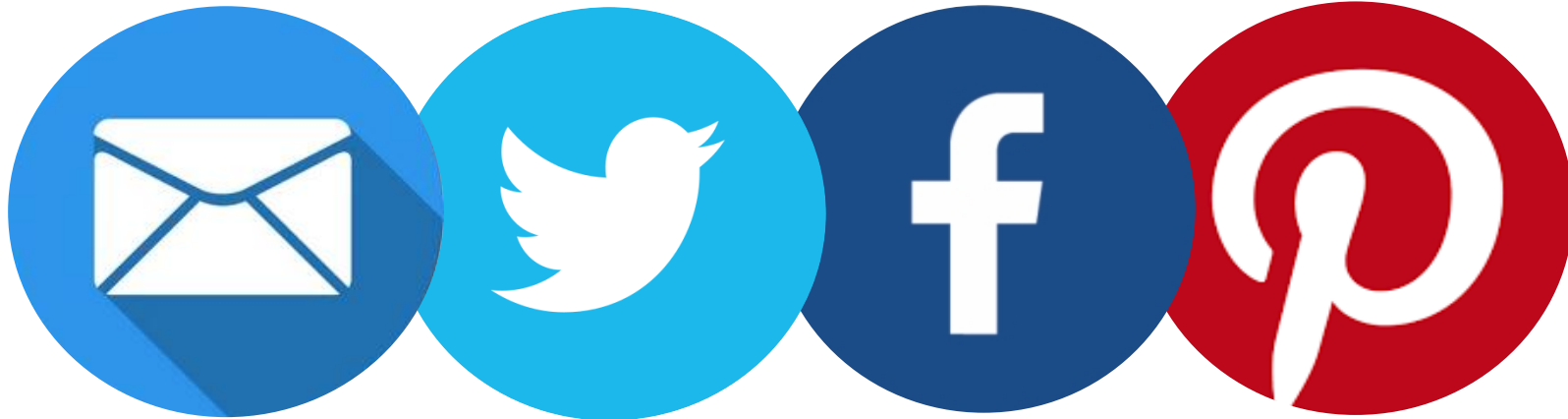


Acknowledgments

- **Dr. Erik Willis** for slides based on his paper on compliance in Go NAPSACC implementation
- **Ms. Emmy Clarke** for her on-demand training paper using Go NAPSACC
- **Ms. Margaret West**, CDC, who led paper on multi-state Go NAPSACC implementation practices
- **Ms. Amber Vaughn** for design of GNS KY project and slides from earlier presentation

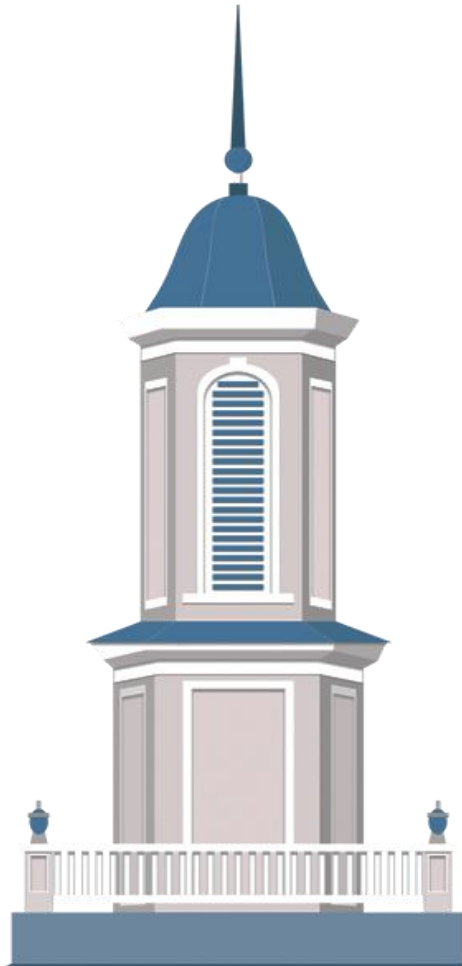


Thank You



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Activity

Example to work through together

- ▶ **Setting: Senior living facilities**
- ▶ **The thing: Multi-level (environment and resident) evidence based PA Intervention**
 - ▶ PA program for residents: video on ways to increase PA throughout the day
 - ▶ Enhanced PA environment to promote PA throughout the day
- ▶ **D&I considerations**
 - ▶ Designing for Dissemination (D4D)
 - ▶ What are key questions to ask?
 - ▶ What outcomes are important to key partners?
 - ▶ How to understand context?
 - ▶ How to build strategy?
 - ▶ How to evaluate outcomes?



Resources



NIH D&I Funding Opportunities

- ▶ PAR-22-105: Dissemination and Implementation Research in Health (R01 Clinical Trial Optional) (<https://grants.nih.gov/grants/guide/pa-files/par-22-105.html>)
- ▶ PAR-22-106: Dissemination and Implementation Research in Health (R03 Clinical Trial Not Allowed) (<https://grants.nih.gov/grants/guide/pa-files/PAR-22-106.html>)
- ▶ PAR-22-109: Dissemination and Implementation Research in Health (R21 Clinical Trial Optional) (<https://grants.nih.gov/grants/guide/pa-files/PAR-22-109.html>)



General D&I resources

- ▶ **Washington University in St. Louis - Toolkits**

- ▶ Intro to D&I, Formulating Aims, Understanding Barriers & Facilitators for Successful Implementation, Identifying Research Outcomes, + more
- ▶ <https://implementationresearch.wustl.edu/support-your-research/toolkits/>

- ▶ **National Cancer Institute - Implementation Science Resources**

- ▶ <https://cancercontrol.cancer.gov/is>
- ▶ <https://cancercontrol.cancer.gov/is/tools/research-tools>

- ▶ **University of Washington - Implementation Science Resource Hub**

- ▶ <https://impsciuw.org/>

- ▶ **Training Institute for Dissemination and Implementation Research in Cancer (TIDIRC): OpenAccess**

- ▶ <https://cancercontrol.cancer.gov/is/training-education/training-in-cancer/TIDIRC-open-access>

- ▶ **Advancing Health Equity Through Implementation Science: Bibliography and Resources**

- ▶ https://consortiumforcanceris.org/files/Health_Equity_and_Implementation_Science_Bibliography_508.pdf

- ▶ **Resources for Stakeholder & Community Engagement**

- ▶ https://cancercontrol.cancer.gov/sites/default/files/2021-08/CCIS_Engagement-Bibliography_080931_508.pdf



Theories, Models, and Frameworks Resources



[About Us](#) | [Contact Us](#)

[Access the D&I Models Webtool](#) | [Guidance](#)

D&I Models Webtool

Explore D&I Models

Plan

Select

Combine

Adapt

Use

Measure

Helping Navigate Dissemination Implementation Models

The D&I Models Webtool is an interactive, online tool that helps researchers and practitioners navigate D&I by selecting, combining, adapting, using, and linking.

[Access The D&I Models Webtool Here!](#)

Explore Models

Type In name...

D and or I i

- D>I
- D=I
- Dissemination
- Implementation

Socio-Ecological Levels i

- Individual

Explore D&I Models

You can search for D&I Models by entering a keyword OR by selecting from the categories below.

Model	D &/or I	Socio-Ecological Levels	Field of Origin	Times Cited
A Model for Evidence-Based Practice				
ACE Star Model of Knowledge Transformation	D>I	Individual Organization Community	Nursing	44
Active Implementation Framework	I-Only	Individual Organization Community	Education	1870
Adaptation in dissemination and implementation science	I-Only	Individual Organization Community System	Health Disparities	39
Adherence Optimization Framework	I-Only	Individual Organization Community System	Sports Injury Prevention	14
Advancing health disparities research within the health care system	D>I	Organization Community System	Health Disparities	174
Advancing Research and Clinical Practice through Close Collaboration (ARCC) Model of	D>I	Individual Organization	Nursing	1680

A few key tips to help you navigate the webtool:

A tutorial is available for each section of the webtool under the Tutorial section of the website.

In this webtool, the term 'Models' is used to refer to both theories and frameworks that enhance the dissemination and Implementation of evidence-based Interventions.

Use

Measure

Searchable website: <https://dissemination-implementation.org/>

Video: <https://www.youtube.com/watch?v=EV8bfXJ75zM&t=397s>

Theories, Models, and Frameworks Resources

THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

[Accessibility](#) | [Events](#) | [Libraries](#) | [Maps](#) | [Departments](#) | [ConnectCarolina](#) | [UNC Search](#)



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Theory, Model, and Framework Comparison and Selection Tool (T-CaST)

What is the purpose of this tool?

Implementation researchers can use this tool to assess the utilization of one or more **theory, model, or framework (TMF)** in a particular project. More specifically, the tool can be used for:

- Considering the characteristics of TMFs most important for the project
- Presenting characteristics to stakeholders to identify their priorities
- Evaluating the ways in which one or more TMF meets the needs of the project
- Comparing potential TMFs to select the best fit for the project
- Identifying ways in which multiple TMFs can complement one another to address all important criteria
- Communicating to various stakeholders reasons why a TMF was selected
- Increasing transparency related to TMF selection and use in reporting (manuscripts, grants, etc.)

Study designs for D&I science

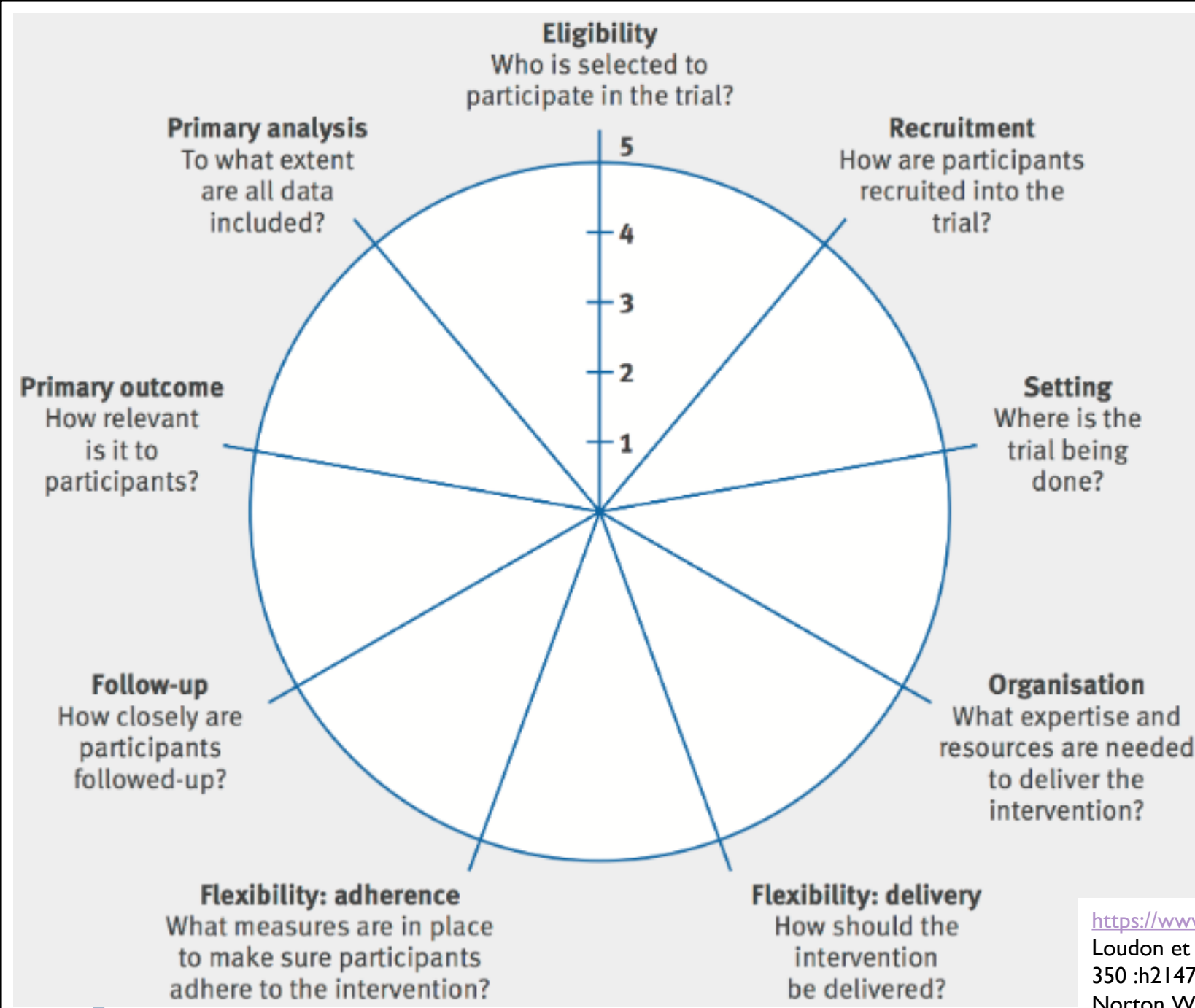
- ▶ Curran GM, et al. Effectiveness-implementation hybrid designs: combining elements of clinical effectiveness and implementation research to enhance public health impact. *Med Care*. 2012 Mar;50(3):217-26. doi: 10.1097/MLR.0b013e3182408812.
- ▶ Mazzucca S, et al. Variation in Research Designs Used to Test the Effectiveness of Dissemination and Implementation Strategies: A Review. *Front Public Health*. 2018 Feb 19;6:32. doi: 10.3389/fpubh.2018.00032.
 - ▶ Esp Figure 3
- ▶ Landsverk J, et al. Design and Analysis in Dissemination and Implementation Research. In: Brownson RC, Colditz GA, Proctor EK, eds. *Dissemination and Implementation Research in Health: Translating Science to Practice*. 2nd ed. New York: Oxford University Press; 2017:201-227.
- ▶ Hwang S, et al. Designs and methods for implementation research: Advancing the mission of the CTSA program. *J Clin Transl Sci*. 2020 Mar 4;4(3):159-167. doi: 10.1017/cts.2020.16.
- ▶ Videos
 - ▶ <https://www.youtube.com/watch?v=VnInpEkuhqw>
 - ▶ <https://www.youtube.com/watch?v=dvscLyHrd-k>
- ▶ PRECIS-2 (next slide)





- ▶ PRECIS – PRagmatic Explanatory Continuum Indicator Summary
- ▶ Tool to help trialists designing clinical trials consider where they would like their trial to be on the pragmatic/explanatory continuum

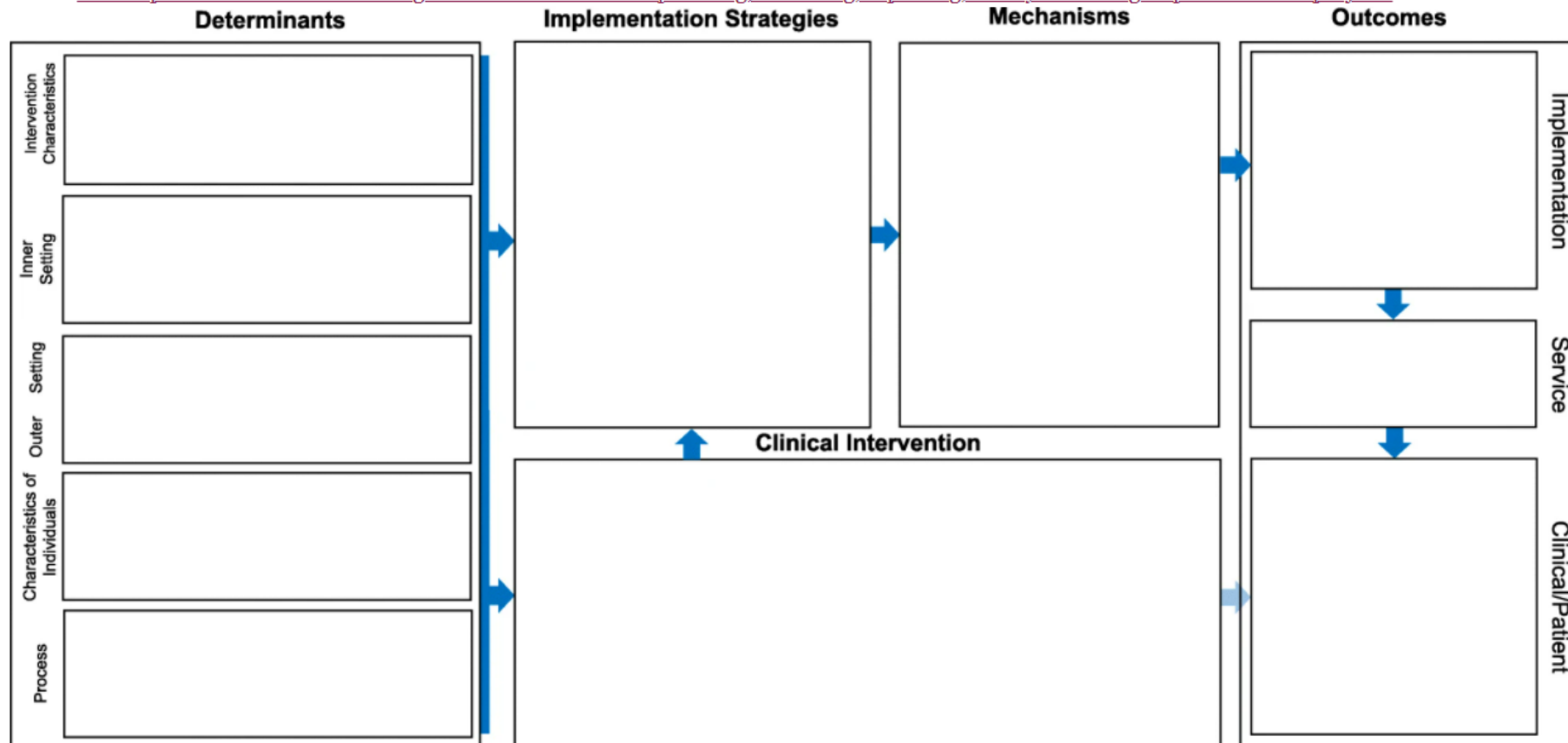
<https://www.precis-2.org/>
Loudon et al. The PRECIS-2 tool: designing trials that are fit for purpose *BMJ* 2015; 350 :h2147
Norton, W.E. et al. Designing provider-focused implementation trials with purpose and intent: introducing the PRECIS-2-PS tool. *Implementation Sci* 16, 7 (2021).



Implementation Research Logic Model

Fig. 2

From: [The Implementation Research Logic Model: a method for planning, executing, reporting, and synthesizing implementation projects](#)



Implementation Research Logic Model (IRLM) Standard Form with Intervention. *Notes.* Domain names in the determinants section were drawn from the Consolidated Framework for Implementation Research. The format of the outcomes column is from Proctor et al. 2011

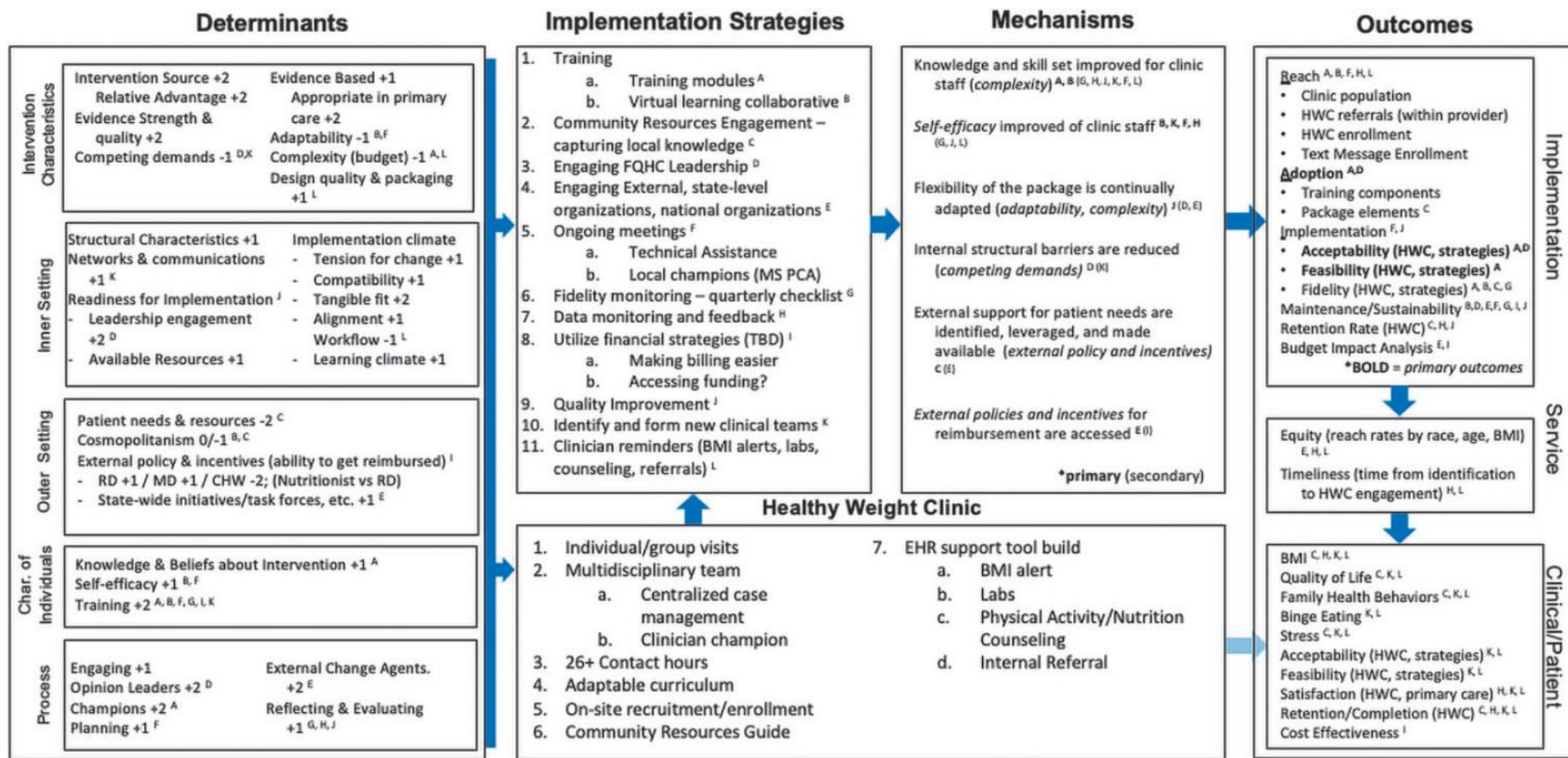


Figure 1. Implementation Research Logic Model for the *Healthy Weight Clinic* pediatric weight Management Intervention. Superscript letters denote linkages between the determinants, strategies, mechanism, and outcomes. Superscript numbers denote the relative strength of the determinant based on the coding system of Damschroder and Lowery³⁵ to gauge the relative strength of the determinant on the following scale: -2 (strong negative impact), -1 (weak negative impact), 0 (neutral or mixed influence), 1 (weak positive impact), and 2 (strong positive impact). Bold indicates primary outcomes.

Journals

 **BMC** Part of Springer Nature

 **Implementation Science Communications**

<https://implementationsciencecomms.biomedcentral.com/>



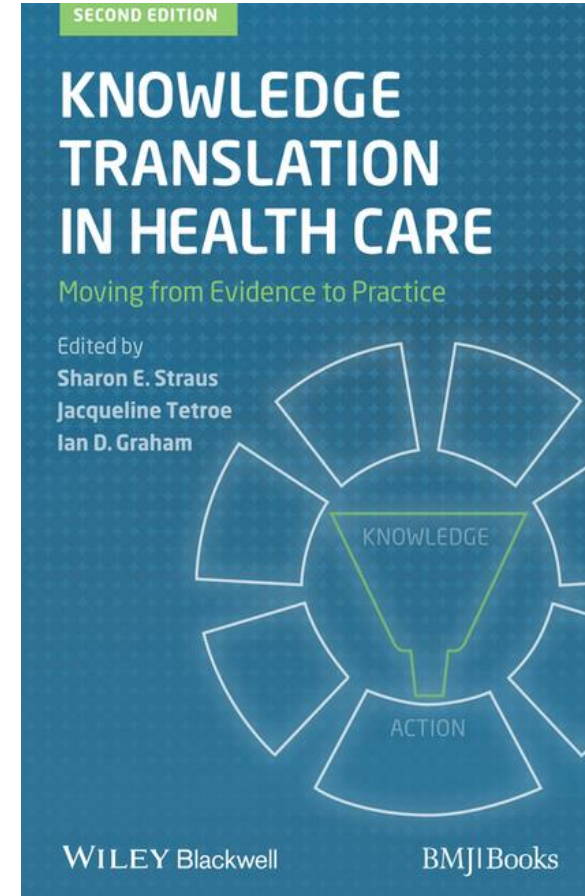
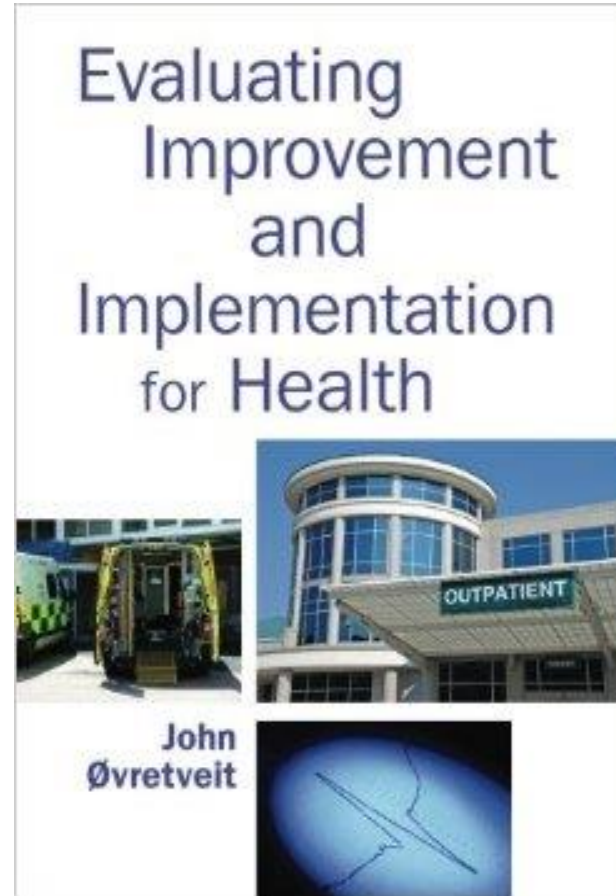
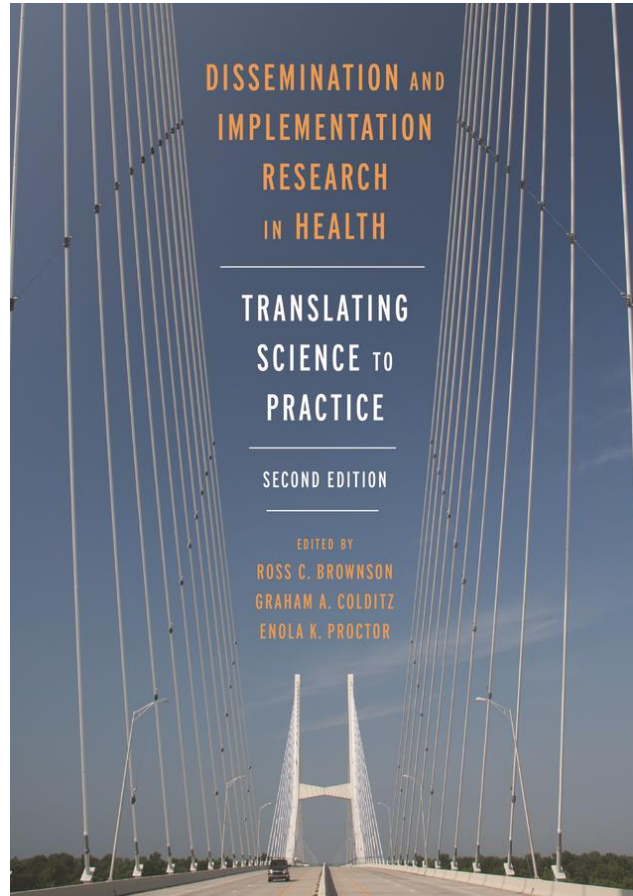
Implementation Science

<https://implementationscience.biomedcentral.com/>



<https://journals.sagepub.com/home/irp>


Textbooks



Practice-Based Research

Additional examples of using research to make for better practice

Predictors of Non-Compliance with a National Early Care and Education-Based Obesity Prevention Initiative: Go NAPSACC

Erik A. Willis, PhD, MPH^{1,2} , Xiuya Chang³, Falon Smith, PhD¹, Emily Clarke, BS, RD, LDN¹, and Dianne S. Ward, PhD^{1,2}

American Journal of Health Promotion
2022, Vol. 36(5) 864–868
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DOI: 10.1177/08901171211069550
journals.sagepub.com/home/ahp


- Database review from June 2014 to November 2020
- Purpose:
 - Examine predictors of not completing the 5-step process
 - Develop a risk stratification score
- 3,883 ECE programs
 - 2,909 programs to examine predictors
 - 974 programs for risk score validation



Predictors of Not Completing the 5-Steps Process



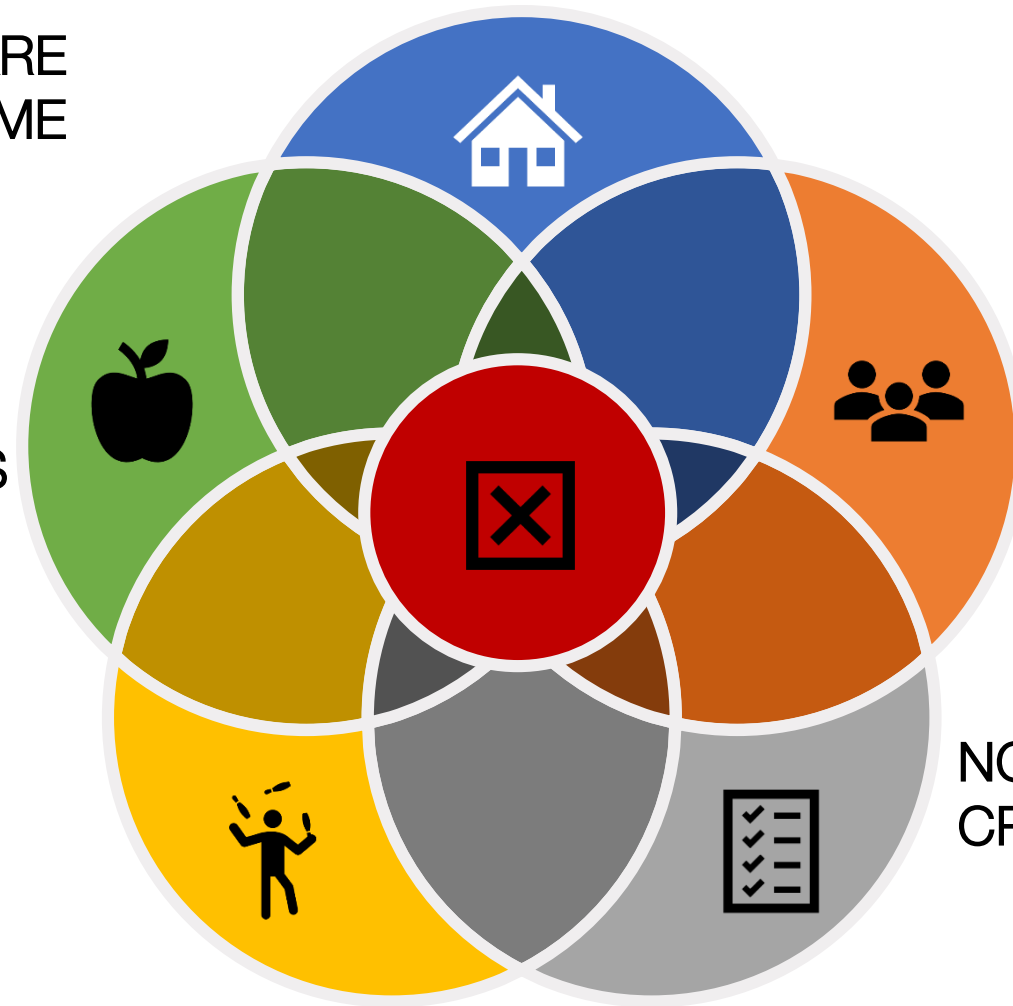
FAMILY CHILDCARE HOME



NON-CACFP PROGRAMS



MULTIPLE MODULES STARTED



UNSUCCESSFUL WITH PAST MODULES 

NO ACTION PLAN CREATED 



Go NAPSACC data can drive stakeholder discussions

- Where do providers struggle?
- What goals are completed most often?
 - What makes these goals attractive to programs?
- What goals are least completed/selected?
 - What supports might encourage completion of other best practices?
- Are there system level challenges
- Where do TAs struggle?
 - How are ECE trainers and technical assistants supported around obesity content?
- Data from Go NAPSACC could support advocating for additional funds



Finding Ways to Make System Change



Go NAPSACC in the Spectrum of Opportunities

Framework for State-Level Obesity Prevention Efforts Targeting ECE Settings

In 2018, the Centers for Disease Control and Prevention proposed a framework for integrating childhood obesity prevention efforts into early care and education settings via state systems work. This graphic presents how Go NAPSACC, an evidence based change process, has been part of that integration across all nine suggested opportunities within the framework.

Statewide Recognition & Intervention Programs

Many states have integrated Go NAPSACC into a recognition or other intervention program. Examples include [breastfeeding friendly certifications](#), using the Go NAPSACC Breastfeeding & Infant Feeding Self-Assessment, and [broader recognitions](#) requiring work in multiple modules.

Statewide Technical Assistance Networks

Participating states commonly use Go NAPSACC as a tool in **statewide technical assistance networks**. Examples of TA networks include [child care resource and referral](#), family child care networks, university extensions, [SNAP-Ed](#), non-profits, and [child care health consultants](#).

Pre-service & Professional Development Systems

Go NAPSACC trainings are eligible for [clock/contact hours](#) in most participating states. Additionally, one state has integrated **Go NAPSACC trainings into Non Formal Child Development Associate** credential courses.

Quality Rating & Improvement System (QRIS)

Several states link Go NAPSACC to QRIS systems in some way, with 3 states formally requiring [nutrition and/or physical activity self-assessments](#) and/or **action plans** to attain higher levels on QRIS.

ECE Funding Streams

Child Care Block Grant quality improvement funds have supported the **cost of the Go NAPSACC license** in some states. Additionally, some states require ECE provider participation in QRIS, which by ripple effect can require Go NAPSACC implementation.

Child Care Food Program (CACFP)

Go NAPSACC compliments CACFP work. Some **CACFP sponsoring organizations** have trained staff as Go NAPSACC consultants, using the resources to help child care programs reach higher nutrition standards. Others combine training on CACFP and Go NAPSACC in TA opportunities.

Licensing & Administrative Regulations

Go NAPSACC best practices are aligned to licensing and administrative regulations in multiple states, with **4 states** actively promoting Go NAPSACC as a resource to help meet health and nutrition licensing standards.

Early Learning Standards

Many states have early learning standard domains related to **health and development**. Go NAPSACC trainings and resources can help child care providers meet these early learning standards.

Statewide Access Initiatives (Farm2ECE)

15 states have used Go NAPSACC specifically in a [Farm to ECE initiative](#). The Go NAPSACC Farm to ECE self-assessment, resource library, and trainings help enhance and evaluate Farm to ECE work.



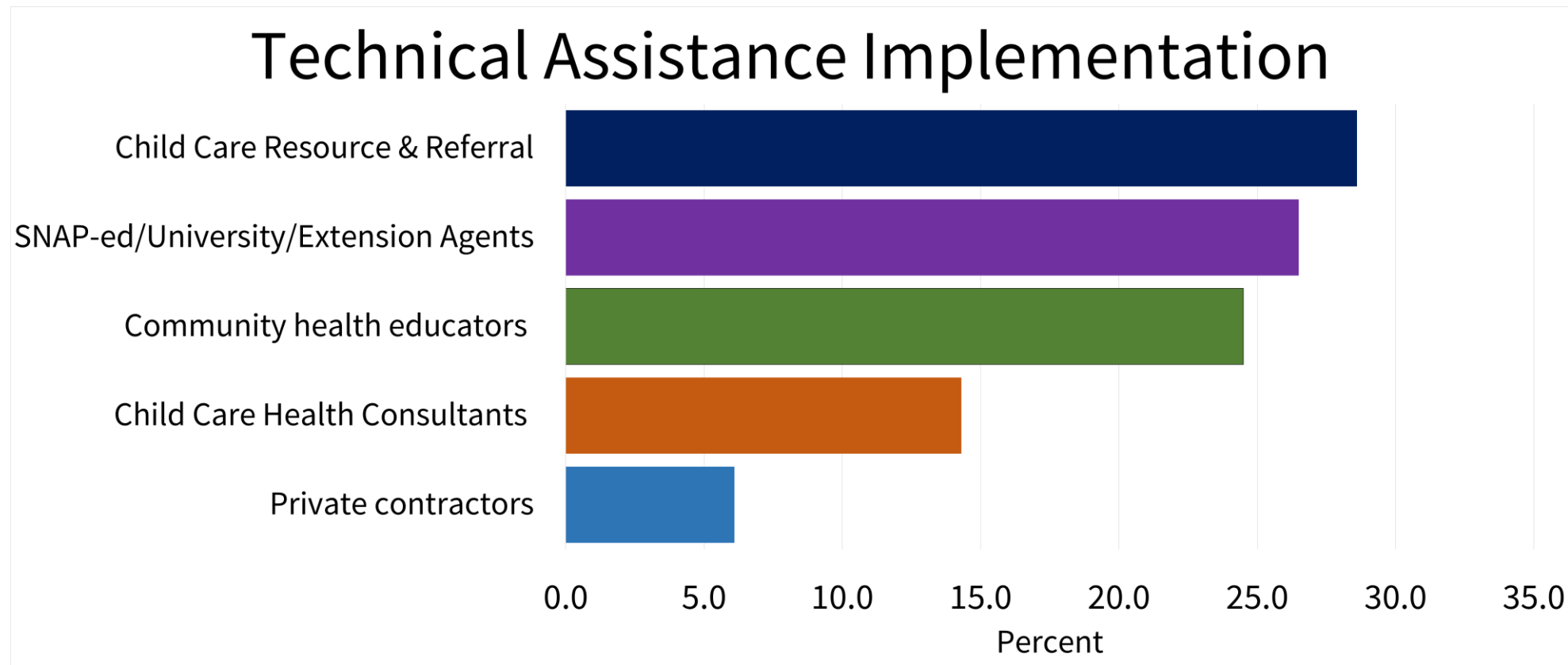
Using Go NAPSACC Aggregate Data

- Data were obtained from the Go NAPSACC web-based platform
- Data were collected and maintained at UNC
- State administrators and individual ECE programs self-reported through the online system.
- State administrators provided information on key Go NAPSACC implementation factors

West et al. (in press) Multi-State Implementation of Go NAPSACC to Support Healthy Practices in the Early Care and Education Setting *Health Promot. Pract.*



State Integration and Implementation



On average, states use 2 (range 1 to 4) technical assistance systems

Additional Research on Role of Staff Training

Training Library – 35 total

The screenshot shows a web interface for a training library. On the left is a green sidebar with navigation links: My NAPSACC, Self-Assessment, Action Planning, Tips & Materials, **Trainings** (highlighted with a hand cursor), Account, and Help. The main content area has a header with icons for various topics: an apple, a baby, a toothbrush, a tooth, a sneaker, a leaf, and a TV. Below the header is a green banner for 'Outdoor Play & Learning' with a leaf icon. A text box explains that clicking 'Start' begins training and that users can earn a Certificate of Training Completion by passing a quiz and completing an evaluation. Below this are four training cards: 'Outdoor Playtime' (0.50 Contact Hours, Print Handout, Start button), 'Outdoor Play Environment' (0.50 Contact Hours, Print Handout, Start button), 'Education & Professional Development' (0.50 Contact Hours, Print Handout, Start button), and 'Policy' (0.50 Contact Hours, Print Handout, Start button). At the bottom, there is a section for 'Completed Training Sessions' with a 'Show All' button.

Outdoor Play & Learning
Topics:
Outdoor Playtime
Outdoor Play Environment
Policy



Training Development and Dissemination

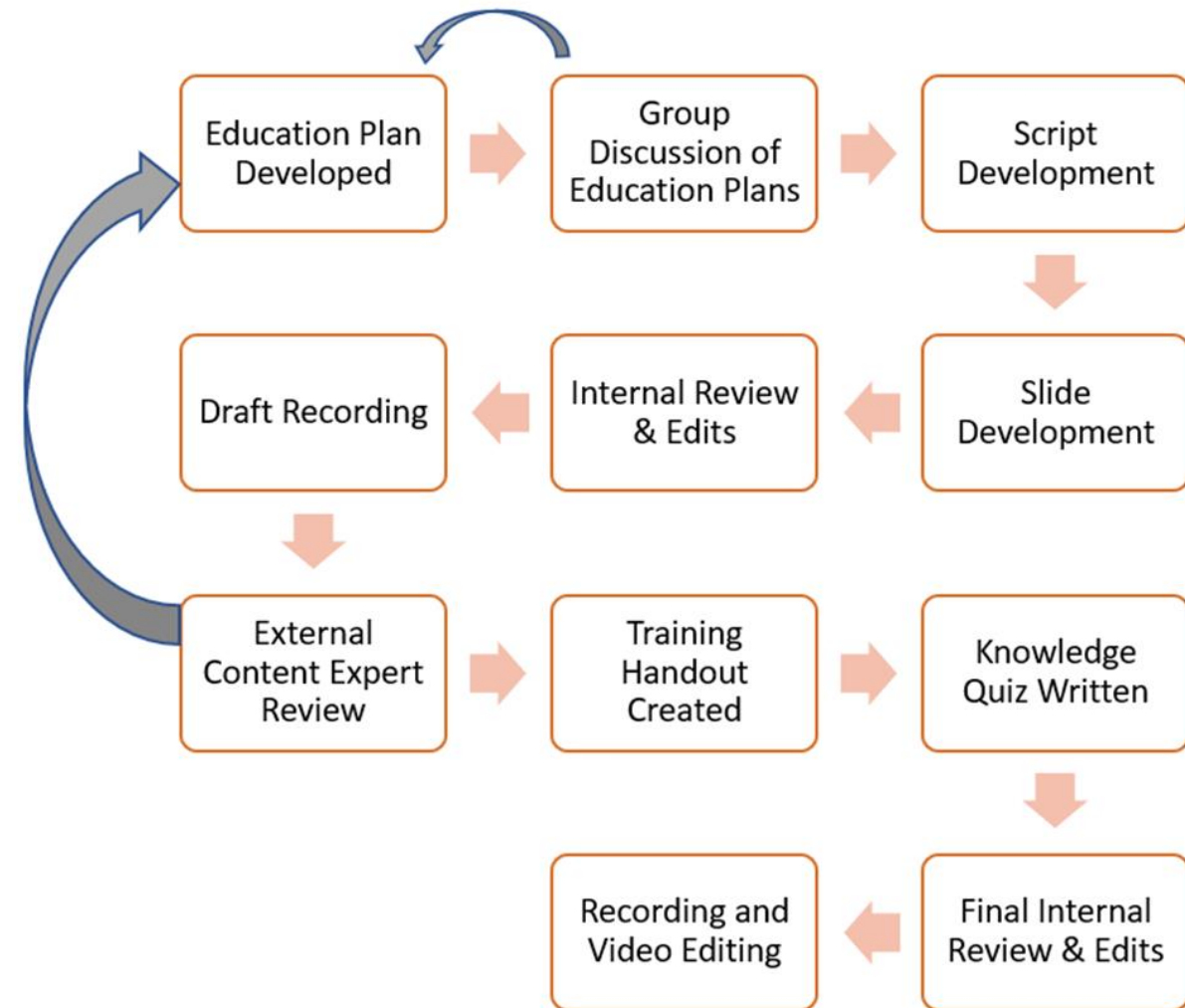
The goal of this project was to:

1. **develop** a library of trainings embedded within the Go NAPSACC website
2. **disseminate** those trainings widely throughout participating states
3. assess **uptake** in participating states over their first year of use

Data sources

- GNS database
- State level survey
 - 20 of 21 states reported on training dissemination

Protocol for Training Development



State Level Dissemination: Barriers and Solutions



Having trainings approved for professional development credit (85% of states) was an important motivator for training completion

Barriers to training approval

1. lack of technological capacity to integrate into state training registry
2. states prohibiting on-demand trainings
3. length of trainings are too short



Strategies used to overcome barriers

1. partnering with Go NAPSACC to develop system linking trainings to state registries
2. having consultants facilitate trainings
3. bundle shorter trainings into packages for approval



Go NAPSACC On-Demand Training Library

Evaluation results by participants

- > 93% trainings were easy to follow
- > 89% trainings were engaging
- > 93% able to apply what they learned

On-demand training were an effective strategy for engaging

- Family child care home
- Rural ECEs
- Urban ECEs

More intentional promotion may be needed to reach non-CACFP ECEs

