Dissemination & Implementation Models
in Health Research & Practice

Plan	Select	Combine	Adapt	Use	Measure
Create a logic model/diagram to identify the most important constructs for your study	Search, view, and select D&I Models	Consider strategies to combine multiple D&I models	Learn ways to adapt D&I Models to your research or practice context	Employ strategies for incorporating D&I Models into all parts of your project	Find and Select measures of constructs related to your D&I models

A workshop on how to plan for, select, combine, adapt, use, and measure Dissemination and Implementation Models in Health

Presented at the 12th Annual Conference on the Science of Dissemination and Implementation in Health (December 4, 2019)

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1. ACCORDS Dissemination and Implementation Science Program at the University of Colorado
   https://bit.ly/2qLWd0z

2. **Dissemination and Implementation Research Core (DIRC)** at the Washington University Institute for Clinical and Translational Science
   https://bit.ly/2OjB7j5

3. **Dissemination and Implementation Science Center (DISC)** at UC San Diego
   https://bit.ly/2QQdXmk

4. **Dissemination and Implementation Models in Health Research and Practice webtool:**
   http://dissemination-implementation.org/

5. **To provide feedback and help with usability testing of the webtool:**
   https://bit.ly/35Dt8Dh

Outline for the workshop and handout:

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Section 1: What are D&I models and why are they important?

Theories present a systematic way of understanding events or behaviors by providing inter-related concepts, definitions, and propositions that explain or predict events by specifying relationships among variables. They are abstract, broadly applicable and not content- or topic-specific.
Frameworks are strategic or action-planning models that provide a systematic way to develop, manage, and evaluate interventions.
Models is used to describe theories and frameworks collectively.

What can D&I models do:
- Ensure inclusion of essential D&I strategies
- Enhance the interpretability of study findings
- Provide systematic structure for the development, management, and evaluation of interventions/D&I efforts
- Models suggest what is important to measure
- Provide explanation why an intervention works (or doesn't work)

Wealth of existing models for D&I:
- 61 models with research focus (Tabak et al., 2012)
    - 25+ models with practitioner/clinician focus (Mitchell at al., 2010)
    - 33 models from a UK perspective (Wilson et al. 2010)
    - 100 + used in an international sample (Birken et al. 2017)
    - 159 KT theories, models, or frameworks (Strifler et al. 2018)
  "Essentially, all models are wrong, but some are useful." (George E.P. Box 1919 – 2013)

Notes:

Section 2: How to create a diagram or roadmap to guide the selection of your D&I model(s)?

Plan

Create a logic model/diagram to identify the most important constructs for your study
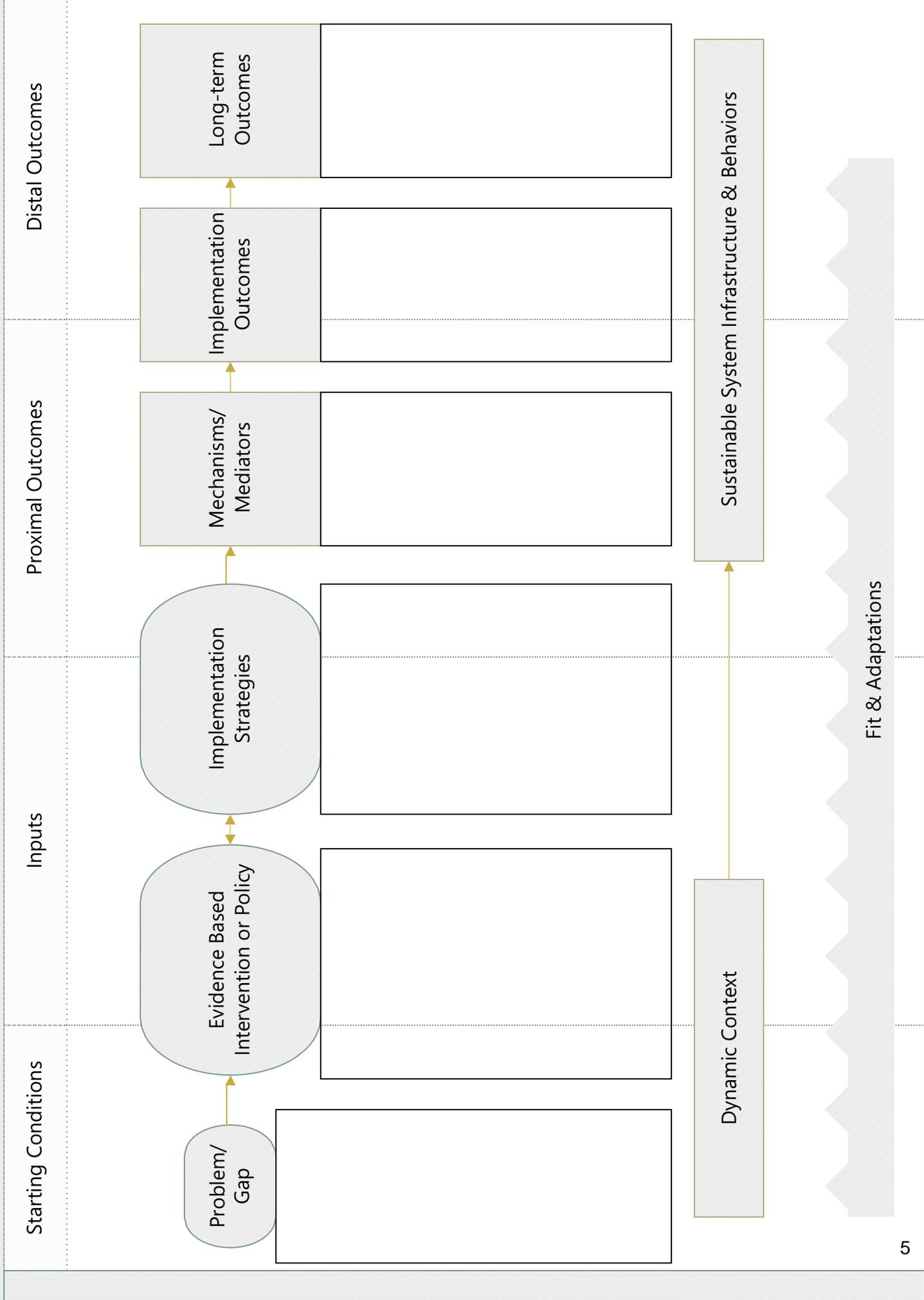
A logic model or diagram of the issues, activities, and constructs involved in your dissemination or implementation project can really help with selecting the best D&I model for your project. By a construct, we mean a concept or element in your theory, intervention, implementation strategy, or hypothesized outcome(s).

Notes:

Additional materials:
- Logic model template (page 5)
- Logic model worksheet (pages 6-7)
- Example completed logic models and worksheet (see website)

Logic Model of Implementation Science Project: _____

Starting Conditions	Inputs	Proximal Outcomes	Distal Outcomes

Problem/ Gap

Evidence Based Intervention or Policy

Implementation Strategies

Mechanisms/ Mediators

Implementation Outcomes

Long-term Outcomes

Sustainable System Infrastructure & Behaviors

Dynamic Context

Fit & Adaptations

IMPLEMENTATION PROJECT LOGIC MODEL WORKSHEET
for : _____

Use this worksheet in tandem with the logic model diagram to help plan your implementation study

1.) **PROBLEM:** A clearly defined problem or gap in the existing evidence

☐ Dissemination   ☐ Individual Level   ☐ Context-inner setting

☐ Implementation   ☐ Org. Level   ☐ Context-outer setting

☐ Policy   ☐ System Level   ☐ Pt/Target Audience

Other Key Constructs and Notes:

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2.) **EVIDENCE BASED INTERVENTION:** Identify key constructs related to key components (key functions) of the intervention

☐ Cost   ☐ Dose   ☐ Trialability

☐ Relative Advantage ☐ Acceptability   ☐ Complexity

Other Key Constructs and Notes:

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3.) **IMPLEMENTATION STRATEGIES:** Identify key constructs related to the implementation strategy(s)

☐ Fit   ☐ Compatibility   ☐ Communication Channels

☐ Dose   ☐ Champion   ☐ Stakeholders

Other Key Constructs and Notes:

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General Comments:

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4.) **MECHANISMS:** Identify key constructs related to hypothesized mediating mechanisms

☐ Process ☐ Goals ☐ Knowledge Transfer

☐ Knowledge ☐ Engagement ☐ Readiness

Other Key Constructs and Notes:

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5.) **IMPLEMENTATION OUTCOMES:** Identify key constructs related to implementation success

☐ Outcomes QI ☐ Cost ☐ Maintenance/Sustainability

☐ Reach ☐ Adoption ☐ Adaptation & Evolution

☐ Fidelity

Other Key Constructs and Notes:

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6.) **LONG TERM OUTCOMES:** Identify key constructs in order to select measures determining success

☐ Outcomes - Health/QoL ☐ Fidelity ☐ Maintenance/Sustainability

☐ ☐ ☐

Other Key Constructs and Notes:

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General Comments:

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Section 3: How do you select D&I model(s)?

Select

Search, view, and select D&I Models

Selection of D&I models can be guided by a logic model or diagram that highlights the most critical constructs of the program.

A few questions to consider:
- What is/are the research questions I'm seeking to answer?
- What level(s) of change am I seeking to explain?
- What characteristics of context are relevant to the research questions?
- What is the timeframe?
- Are measures available?
- Does the study need to be related to a single model?

(Adapted from Chambers, 2014 (Chapter Two) in Beidas & Kendall (eds), OUP)

Notes:

Additional materials:
- Search engine to select D&I models (see website)

Section 4: What are strategies to combine and adapt D&I model(s)?

Combine

Consider strategies to combine multiple D&I models

There are many occasions when selecting just one model will not address all your needs for guiding the planning, design, implementation, and evaluation activities. Nilsen classified D&I models into five broad categories based on their primary purpose: process models, determinant frameworks, classic theories, implementation frameworks, and evaluation frameworks. When one model does not suffice, you might decide to select multiple models and combine them.

Notes:

Additional materials:
- Examples for combining D&I models (see website)

Section 5: What are strategies to adapt D&I model(s)?

Adapt

Learn ways to adapt D&I Models to your research or practice context

D&I researchers often utilize theory-based approaches that evolve over time based on empirical testing. As you "shop" for an appropriate model, you should review the core concepts, proposed relationships, and outcomes to be sure you are fully informed beyond what is depicted on the graphic. It is helpful to gather associated literature to define concepts and identify any issues or recommended adaptations based on prior studies. There is likely no comprehensive model that will perfectly fit every study, so it may be necessary to either adapt a model and/or to combine multiple models for your study.

Notes:

Additional materials:
- Worksheet to adapt D&I models (pages 11-15)
- Example of D&I model adaptation (see website)

IMPLEMENTATION PROJECT ADAPTATION WORKSHEET

For:_____

This is an exercise to help think through the aspects of your study and those of the selected model, to see what might need to be adapted. There are no right or wrong answers.

Identifying examples
- Looking at the literature, how was the framework originally designed? For many of the models, Table 2 in this publication (Tabak et al, 2012). provides references for the original version of the model.

- Are there examples in the literature where the model has been applied and/or adapted? For many of the models, this publication appendix (Tabak et al, 2012) provides references for examples of model use in Appendix A.

- How does your study differ from other studies where the model has been used, for example in terms of the intervention, setting, or population?

Dissemination and/or implementation focus

- What modifications to the model might help align the model with the study's emphasis on dissemination and/or implementation?

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Addition/deletion/modification of model constructs

Here are some things you might want to think about when you sit down with your team to modify your model

- What constructs initially, intuitively are important for the study and its research questions when you were completing the Select section?

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- What adaptations do you see as beneficial?
  - Are there constructs missing?
  - Could constructs be modified?
  - What might be deleted?

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- What is the purpose of possible adaptations (e.g. enhance Reach or equity); simplify (drop non-central constructs) or reduce costs; add other key constructs?
  - It might be helpful to consider the evidence-based intervention, population, setting, levels, implementation strategy, and/or outcomes when thinking through the constructs, even developing a table, mapping the study component and the purpose of the adaptation.

- What might be some possible implications of these changes?

- If you can identify core components or key things that should NOT be adapted, please list them here.

Re-organization of relationships between model construct

Reminder: many Figures describing the models are available in the Select section

- How are the constructs organized and hypothesized to interact in the model?
    - What might need to change about the organization?
    - It may help to sketch out these important study components, thinking about how they might be related (Reminder: many of the models on this site have images available to view in the Select section.)

- How might these changes alter the interpretations of your findings?

- How will you document these adaptations and if any others are made?

- How will you monitor the impact of these adaptations and if any others are made?

Other Notes:

Section 6: How do you use D&I model(s) across your project?

Use

Employ strategies for incorporating D&I Models into all parts of your project

D&I models should be used to inform all phases of the research process, from early development of D&I research questions through to analyses and dissemination of research findings. The earliest use of a model is often when a grant proposal is being written. It is crucial to introduce your model early in your grant application, generally in the Aims page. "Using the model" means that your protocol is based on the concepts, terminology, and processes described. A common limitation of a grant application is that a model is mentioned in one section, but is not fully integrated across all parts of the proposal. Later, when conducting your study, it is helpful to continually return to your model to ensure that measures and data collection procedures align with the model and its key constructs.

Notes:

Additional materials:
- Worksheet to use D&I models (pages 17-20)
- Example of D&I model in use (see website)

IMPLEMENTATION PROJECT USE WORKSHEET

For: _____

This worksheet is designed to help walk through how a model can be used throughout a research study. This exercise can also help inform if the model should be adapted or combined.

Section of Grant Proposal
Aims

Describe how the selected model helps in shaping your aims, study questions, and/or hypotheses.

Does your model include constructs relevant to both internal[1] and external validity[2]? If so, how does it address both internal validity and external validity?

In one sentence, describe why you choose this model?

1. Internal Validity - The degree to which the inference drawn from a study is warranted when account is taken of the study methods, the representativeness of the study sample, and the nature of the population from which it is drawn.
2. External Validity - The degree to which results of a study may apply, be generalized, or be transported to populations or groups that did not participate in the study.

<u>Significance</u>

Is there previous literature showing the use of your model that will help you in developing the rationale for your study and use of your model? If so, where were studies conducted and how was the model used?

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Are there parts of your model (particularly contextual variables) that have been used in one or more previous studies?

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Is there a quality gap or void in the literature that is illustrated and explicitly addressed in your model?

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Why is your selected/adapted model better for this issue than others you could have chosen?

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<u>Innovation</u>

Does adaptation and/or use of your model advance D&I science? How? The D&I contribution could be adaptation and empirical use. This is covered in more depth in the Adapt section.

Are you using innovative methods to adapt and use your model? This might involve engaging a new set of stakeholders to develop and apply your model. From a research perspective, as long as model adaptations do not become a weakness of the proposed study (when drastic changes are made to a model), it provides an excellent opportunity for model testing.

Are you using a model from a field different from your own (e.g., taking a model from business or engineering and applying it to a health issue)? This could add additional innovation to the study.

Are you applying a model from D&I science to advance a substantive/content area? Even if the model application does not advance D&I science, it may advance science in your substantive/content area.
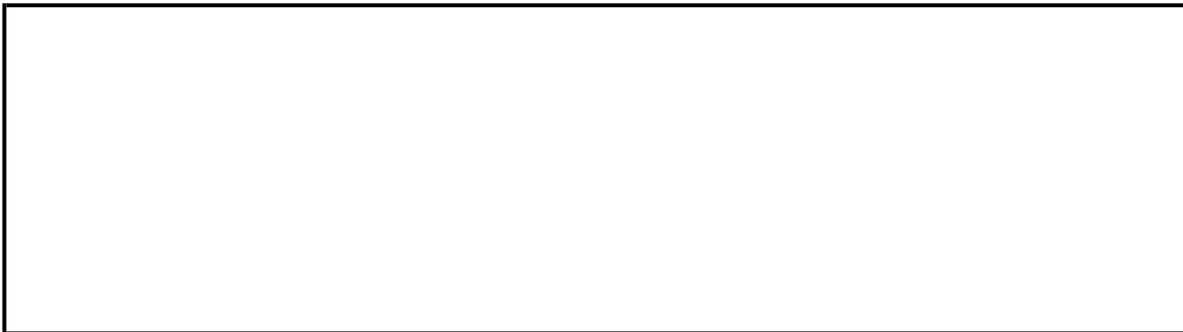
<u>Approach</u>

How does the model inform your study methods?
- Is it linked to the constructs you are measuring (e.g., context, determinants, implementation or client outcomes)? If so, how?
- Are you using measures of concepts and/or constructs in your model? Often, a table or figure is helpful in conveying the linkages between your D&I model and your measures
- Are you using mixed-methods[3]? And if so, how do these methods map to your D&I model?

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- Do your analyses assess the relationships postulated in your model and highlighted on your aims page? For example, how does your model inform the relationships between contextual variables, D&I strategies, and outcomes?
- In what ways does your study balance internal and external validity?

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Other Notes:

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3. Mixed-Methods - An approach for collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies to understand an evaluation problem.

Section 7: What are some strategies to choose measures that align with constructs in your D&I model?

Measure

Find and Select measures of constructs related to your D&I models

D&I models can guide you in deciding what you need to measure in your project. Aligning the constructs from your D&I model with the selected measures in your study will provide you with a systematic approach to ensure that all critical aspects of your intervention, implementation strategy, and context are evaluated. Use of pragmatic measures in D&I science are especially important when you are conducting evaluations in real world settings.

Notes:

Additional resources:

- The SIRC Instrument Review Project (https://bit.ly/2DgP7UC)
- Grid-enabled Measures Database - D&I Workspace (https://bit.ly/2OIICPJ)

Other Resources for D&I models

1. D&I Models Website:
   - http://dissemination-implementation.org/

2. T-CaST: an implementation Theory Comparison and Selection Tool:
   - https://impsci.tracs.unc.edu/tcast/

3. Tabak, R., Khoong, E., Chambers, D., & Brownson, R. (2012). Bridging Research and Practice. *American Journal of Preventive Medicine, 43*(3), 337-350.
   - https://www.ncbi.nlm.nih.gov/pubmed/22898128

4. Nilsen, P. (2015). Making sense of implementation theories, models and frameworks. Implementation Science, 10(1), 53.
   - https://implementationscience.biomedcentral.com/articles/10.1186/s13012-015-0242-0

5. Nilsen, Per, & Bernhardsson, Susanne. (2019). Context matters in implementation science: A scoping review of determinant frameworks that describe contextual determinants for implementation outcomes. Bmc Health Services Research, 19(1), 1-21.
   - https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-019-4015-3

6. Birken, S., Powell, B., Shea, C., Haines, E., Kirk, M., Leeman, J., . . . Presseau, J. (2017). Criteria for selecting implementation science theories and frameworks: Results from an international survey. Implementation Science, 12(1), 1-9.
   - https://implementationscience.biomedcentral.com/articles/10.1186/s13012-017-0656-y

7. Strifler, L., Cardoso, R., Mcgowan, J., Cogo, E., Nincic, V., Khan, P., . . . Straus, S. (2018). Scoping review identifies significant number of knowledge translation theories, models, and frameworks with limited use. *Journal of Clinical Epidemiology, 100*, 92-102.
   - https://www.ncbi.nlm.nih.gov/pubmed/29660481

8. Moullin, J. C., Dickson, K. S., Stadnick, N. A., Albers, B., Nilsen, P., Broder-Fingert, S., Mukasa, B. & Aarons, G. A. Ten Recommendations for Using Implementation Frameworks in Research and Practice. (Manuscript submitted for publication)