About the series

• **Description**
  • This series provides an introduction to dissemination and implementation (D&I) science and a theoretical foundation to translate evidence into clinical practice, health policy, or public health.

• **Sessions**
  • Wed, 9/1: Implementation Science 101
  • Wed, 9/15: Study Designs in Implementation Science
  • Wed, 9/29: Integrating Implementation Science Frameworks and Behavioral Theory into Implementation Research
  • Wed, 10/13: Process Evaluation and Implementation Monitoring
A little about me…

• I have formal training in exercise science, health behavior, epidemiology, & implementation science

• I’ve been conducting implementation science research since 2003.

• The primary focus of my research has been the epidemiology of health behaviors related to obesity and the design, delivery, and evaluation of interventions to prevent or treat obesity.
Recommended Texts

• Dissemination and Implementation Research in Health: Translating Science to Practice (2nd Edition)
  • Ross C. Brownson, Graham A. Colditz, Enola K. Proctor

• Handbook on Implementation Science
  • Per Nilsen & Sarah A. Birken
An introduction to Implementation Science
Objectives for today

- To explain why we need dissemination & implementation science
- To define terminology relevant to dissemination & implementation research
- To differentiate implementation from quality improvement and related concepts
- To provide context for dissemination & implementation research in the translation continuum
- To provide a brief introduction to frameworks that can guide dissemination & implementation research
Why D&I science?

• Innovations are sometimes spread passively, but most often they are not
  • Often require active dissemination
• Evidence-based innovations, once disseminated, must be put into practice
  • Moving from adoption to maintenance can be a complicated process
• Often, ineffective or outdated practices need to be uninstalled
• Evaluation shouldn’t be limited to effectiveness
Terminology
What is D&I research?

- **Dissemination research** is 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.

- **Implementation research** is 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.

Terminology

• **Dissemination**: An active approach of spreading evidence-based interventions to the target audience via determined channels using planned strategies.

• **Implementation**: The process of putting to use or integrating evidence-based interventions within a specific setting.

• **Innovation**: “An idea, practice, or object that is perceived as new by an individual or other unit of adoption” (Rogers, 2003)
Terminology

• **Evidence-based intervention**: The objects of dissemination and implementation are interventions with proven efficacy and effectiveness.

• **Quality Improvement**: a systematic, formal approach to the analysis of practice performance and efforts to improve performance (AAFP, 2018).

• **Implementation Monitoring**: the measurement of what is actually happening during an intervention compared to what is supposed to be happening in an intervention.
Implementation Science Questions

What Are the Innovations?
- Interventions
- Tools
- Programs

Who/What Is Affected?
- Policy
- Community
- Health Care System
- Provider
- Individual

How Do We Improve Implementation?
- Interactive Assistance: Working with stakeholders during implementation
- Adapt and Tailor: Modifying implementation based on needs
- Support Practitioners: Empowering them to effectively implement the innovations
- Engage Consumers: Involving individuals and families directly

How Do We Know If Implementation Is Successful?
- Acceptability: Innovation is perceived to be appropriate to stakeholders
- Uptake: Innovation is used
- Cost: Acceptable cost of supporting innovation delivery
- Fidelity: Innovation is delivered as intended
- Sustainment: Innovation is effectively delivered over time

What Are the Implementation Challenges?
- Underuse: Failing to deliver the innovation to those who would benefit
- Overuse: Delivering the innovation to those who will not benefit

What Are the Desired Outcomes?
- Increased Years of Life
- Improved Quality of Life
- Health Equity
Quality Improvement vs. Implementation
Quality Improvement vs. Implementation

- **Quality Improvement**
  - Scale: small
  - Resources: low
  - Intended duration: short
  - Tolerance for failure: high
  - Feedback: continuous

- **Implementation**
  - Scale: medium to large
  - Resources: high
  - Intended duration: long
  - Tolerance for failure: low
  - Feedback: varies
Dissemination & Implementation Research in the Translation Continuum
Stakeholders at translational steps in the NIH Roadmap Initiative


*Fig. 1. The Integrative Framework of Dissemination, Implementation, and Translation (IFDIT).*
Frameworks that can guide Dissemination & Implementation Research
Many models to choose from…

Bridging Research and Practice
Models for Dissemination and Implementation Research

Rachel G. Tabak, PhD, Elaine C. Khoong, BS, David A. Chambers, DPhil,
Ross C. Brownson, PhD

Context: Theories and frameworks (hereafter called models) enhance dissemination and implementation (D&I) research by making the spread of evidence-based interventions more likely. This work organizes and synthesizes these models by (1) developing an inventory of models used in D&I research; (2) synthesizing this information; and (3) providing guidance on how to select a model to inform study design and execution.

Evidence acquisition: This review began with commonly cited models and model developers and used snowball sampling to collect models developed in any year from journal articles, presentations, and books. All models were analyzed and categorized in 2011 based on three author-defined variables: construct flexibility, focus on dissemination and/or implementation activities (D/I), and the socioecologic framework (SEF) level. Five-point scales were used to rate construct flexibility from broad to operational and D/I activities from dissemination-focused to implementation-focused. All SEF levels (system, community, organization, and individual) applicable to a model were also extracted. Models that addressed policy activities were noted.

Evidence synthesis: Sixty-one models were included in this review. Each of the five categories in the construct flexibility and D/I scales had at least four models. Models were distributed across all levels of the SEF; the fewest models (n=8) addressed policy activities. To assist researchers in selecting and utilizing a model throughout the research process, the authors present and explain examples of how models have been used.

Conclusions: These findings may enable researchers to better identify and select models to inform their D&I work.

Many models to choose from…

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Sixty-one models were included in this review.

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IN 2012!!!

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Considerable variability in focus, flexibility, and level of focus exists

Table 2. Categorization of D&I models for use in research studies

<table>
<thead>
<tr>
<th>Model</th>
<th>Dissemination and/or implementation</th>
<th>Construct flexibility: broad to operational</th>
<th>Socioecologic Level</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diffusion of Innovation</td>
<td>D-only</td>
<td>1</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>RAND Model of Persuasive Communication and Diffusion of Medical Innovation</td>
<td>D-only</td>
<td>1</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Effective Dissemination Strategies</td>
<td>D-only</td>
<td>2</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Model for Locally Based Research Transfer Development</td>
<td>D-only</td>
<td>2</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Streams of Policy Process</td>
<td>D-only</td>
<td>2</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>A Conceptual Model of Knowledge Utilization</td>
<td>D-only</td>
<td>3</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Conceptual Framework for Research Knowledge Transfer and Utilization</td>
<td>D-only</td>
<td>3</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Conceptualizing Dissemination Research and Activity: Canadian Heart Health Initiative</td>
<td>D-only</td>
<td>3</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Policy Framework for Increasing Diffusion of Evidence-Based Physical Activity Interventions</td>
<td>D-only</td>
<td>3</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>
Consolidated Framework for Implementation Research (CFIR)

- Intervention
  - Eight constructs
- Outer setting
  - Four constructs
- Inner setting
  - Five constructs
    - Nine sub-constructs
- Individuals
  - Five constructs
- Process
  - Four constructs
    - Four sub-constructs
Translation gap

• A research-practice gap exists across all fields of public health and medical practice
• Our inability or unwillingness to apply what is known to improve health results in significant health deficits and persistent inequalities.
  • For example, it is estimated that the lives of 6 million children could be saved each year if 23 proven interventions were implemented in 42 countries.
• This translation gap is partially due to a lack of dissemination
What is known

- Passive approaches to dissemination are largely ineffective because uptake does not happen spontaneously.
- Stakeholder engagement in research and evaluation processes is likely to enhance dissemination.
- The dissemination of research to nonscientists is enhanced when messages are framed in ways that evoke emotion and interest and demonstrate usefulness.
What is known

• At an agency level dissemination approaches should be time efficient, consistent with organizational climate, culture, resources, and aligned with the skills of staff members

• Dissemination to policy audiences needs to take into account unique characteristics of policy makers as dissemination targets

• The objective of research dissemination is to achieve impact; measures of academic impact often differ significantly from the markers of importance to practice and policy audiences
Components of dissemination

• Source
  • Where is the new innovation or knowledge coming from?

• Message
  • What is the new information to be disseminated?

• Audience
  • There is a higher likelihood of success when a product and promotion strategy is targeted to the characteristics of a desired segment.

• Channel
  • There are multiple approaches or channels for reaching various audiences, each with distinct pros, cons, and costs
RE-AIM

• The RE-AIM framework is designed to enhance the quality, speed, and public health impact of efforts to translate research into practice in five steps:
  • Reach your intended target population
  • Efficacy (or more often effectiveness)
  • Adoption by target staff, settings, systems or communities
  • Implementation consistency, costs, and adaptations made during delivery
  • Maintenance of intervention effects in individuals and settings over time
### Why is this important? Impact of loss at each RE-AIM CONCEPT

#### Example of Translation of Interventions into Practice

<table>
<thead>
<tr>
<th>Dissemination Step</th>
<th>RE-AIM Concept</th>
<th>% Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% of settings use intervention</td>
<td>Adoption</td>
<td>50.0%</td>
</tr>
<tr>
<td>50% of staff take part</td>
<td>Adoption</td>
<td>25.0%</td>
</tr>
<tr>
<td>50% of patients identified, accept</td>
<td>Reach</td>
<td>12.5%</td>
</tr>
<tr>
<td>50% follow regimen correctly</td>
<td>Implementation</td>
<td>6.2%</td>
</tr>
<tr>
<td>50% benefit from the intervention</td>
<td>Effectiveness</td>
<td>3.2%</td>
</tr>
<tr>
<td>50% continue to benefit after six months</td>
<td>Maintenance</td>
<td>1.6%</td>
</tr>
</tbody>
</table>
In the next lectures...

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Web-based resources

University of Washington Implementation Science Resource Hub:
• http://impsciuw.org

Consolidated Framework for Implementation Research:
• https://cfirguide.org/

Dissemination & Implementation Model selection tool:
• http://www.dissemination-implementation.org/

Overcoming Barriers to Implementation in Global Health toolkit:
• https://www.fic.nih.gov/About/center-global-health-studies/neuroscience-implementation-toolkit/Pages/default.aspx
Questions?