Setting Your Compass towards D&I

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UW Madison D&I Short Course
The Need:

Although we spend approximately 3 trillion dollars annually on the healthcare system.....

The U.S. ranks last in health care among wealthy countries.
The Need

- The U.S. spends $130 billion annually on health research

  YET

- It takes 17 years, on average, to translate 14% of original research into benefits for the public

Slide courtesy of Melody Bockenfeld
The Gap: most proven interventions do not get implemented

- Provides detailed information about 22 fall intervention studies published 2005–2009
- Interventions tested in RCTs & shown to reduce falls
- Only 3 are in practice

www.cdc.gov/HomeandRecreationalSafety/Falls/pubs.html
The Challenge

One of our greatest challenges to achieving improved health for the public is closing the **Gap** between:

- What we know works to improve health
- And what we actually implement in community and clinical settings
Why Doesn’t Discovery Lead to Use?

- Interventions are not ready for broad dissemination.
- End users (community) not aware of interventions.
- Interventions are not in a format for end users to use.
- Resources and infrastructure not in place to promote dissemination and maintenance.
D&I Research

1. Dissemination Research: Examines the process of spreading knowledge regarding an evidence-based intervention within specific settings.

2. Implementation Research: Examines the process of adopting, integrating, and using evidence-based health interventions within specific settings.
Definitions

- **Innovation** = what is implemented
- **Implementation strategies** = what are used to implement the innovation.

Implementation strategies can make the difference between effectiveness and non-effectiveness of your innovation.

- A program is only as good as your implementation of it.
Where does D&I Research begin?

- Proven intervention
- Community engagement
Define your question

1. What is most important?
   • Who is it reaching or not and why?
   • What organizations/systems are taking it up or not and why?
   • Is it being implemented with fidelity and what can be done if not?

2. The question will drive:
   • Choice of theoretical model
   • Evaluation measures and methodology

3. Choosing the question requires:
   • Knowledge of intervention’s actual (or anticipated) dissemination and/or implementation.
   • Community input
Choosing your theoretical model

1. Model characteristics
   • Construct flexibility – Is model loosely outlined vs very operational?
   • Dissemination and/or implementation – Does model apply to D vs I vs both?
   • Socioecologic framework – Does model operate at individual, organizational, community, or system level?

2. Choice of model depends on your question

3. https://ictr.wisc.edu/DnIRResources
Two models

- CFIR – Consolidated Framework for Implementation Research
- Replicating Effective Programs Framework
CFIR: Consolidated Framework for Implementation Research

- Includes constructs from other theories
- Designed to overcome gaps in those theories and systematize language across theories

Damschroder LJ, Implementation Science 2009, 4:50
Consolidated Framework for Implementation Research (CFIR)

from:
Setting

- **Outer**
  - Patient-centeredness of organization and resources to that end
  - Cosmopolitanism
  - Peer pressure
  - External policies and incentives

- **Inner**
  - Structural characteristics of organization
  - Networks and communications in organization
  - Culture
  - Implementation climate
  - Characteristics of individuals
Process

- Planning
- Engaging
- Executing
- Reflecting and evaluating
Replicating Effective Programs Framework

Kilbourne AM et al, Implementation Science 2007, 2:42

Pre–Conditions
- Identification of need for new intervention
- Identification of effective intervention that fits local setting
- Packaging intervention for training and assessment

Pre–Implementation
- Orientation: explain core elements; customize delivery
- Logistics planning
- Staff training
- Technical assistance

Implementation
- Ongoing support of and partnership with community orgs
- Booster training
- Process evaluation
- Feedback and refinement of intervention package, training

Maintenance and Evolution
- Organizational and financial changes to sustain intervention
- Prepare package for national dissemination
- Re–customize delivery as need arises
Understanding what to study

- Model describes how to implement
  - Include community at all stages
  - Consider context
  - Adapt, test, adapt, test
- RE–AIM Framework describes how to evaluate success of intervention.
Defining success of implementation

- Effectiveness alone?
- Effectiveness plus broad reach?
- Feasibility to implement?
- Ability for organization to maintain it?
# RE–AIM Framework: metrics of dissemination and research

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Choosing your measurement framework

1. RE-AIM often used (but there are others)
   - Reach
   - Adoption
   - Implementation
   - Maintenance
   - Effectiveness
   - May focus on one area more than another, depends on question.
   - BUT program adaptation to improve one metric may worsen another, so consider need to evaluate all
### RE-AIM Framework: enhance quality and public health impact of dissemination

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Identify the question

Question is defined by intervention and community – what is most important?

- How to make intervention feasible to implement and have it still work?
  - Look at adoption, fidelity, effectiveness
- How to increase participation by African-Americans?
  - Look at reach primarily, but also adoption, maintenance
## Identify methods typically qualitative and quantitative

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<td>Who partakes compared to those not partaking, % of target group partaking, reasons for taking part or not</td>
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<tr>
<td>Effectiveness</td>
<td>Pre-post measures, often intermediate not distal</td>
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<tr>
<td>Adoption</td>
<td>% of institutions adopting, reasons for/against</td>
</tr>
<tr>
<td>Implementation</td>
<td>Fidelity; barriers and facilitators to implementation</td>
</tr>
<tr>
<td>Maintenance</td>
<td>% of institutions continuing to implement; reasons for/against</td>
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Use control group

- **Reach**
  - compare 2 different methods of increasing reach among African-Americans

- **Adoption**
  - Compare two different methods for training program leaders
    - Are leaders as effective with short versus long training?
  - Compare short version of intervention versus long version of intervention
    - Is short version still effective?
Example: Dissemination Research Study on “Stepping On”

- Step 1: Delphi Consensus re Key Elements
- Step 2: Implement and Evaluate Feasibility/Fidelity
- Step 3: Test RE–AIM metrics of intervention with different delivery models
  - 3 different settings, 2 different types of program leaders
Step 1
Delphi Consensus to Determine Key Elements

- With multifaceted program, not clear what is essential and what can be changed
- **Objective**: obtain expert consensus about key features that should be maintained to ensure successful outcomes
- Led to understanding of elements that need to be present for effective program
Step 2
Implement, Evaluate, Modify

**Objective:** Ensure that key elements are present with translation

**Process:**
- Implement program
- Monitor fidelity
- Identify lapses
- Conduct Root Cause Analysis to find causes
- Identify and implement solutions
  - Leader training manual, prerequisites to training, program manual, target group
Step 3  
Test intervention

- Compare different delivery models
  - Retirement community, senior center, parish nurse

- Compare different backgrounds of leaders
  - RN versus social worker

- Compare differences across RE–AIM domains – mixed methods

- Led to site implementation guide, training manual for leaders, criteria for who could be a leader

- Program disseminated by Wisconsin Institute for Healthy Aging – 3/4 of Wi Counties, 19 states
Statewide dissemination and implementation after research study

- Modified Program Manual and created formal training program
- Conducted Delphi and Root Cause Analysis
  - Improved Stepping On Manual
- Improved training program
- Developed fidelity tool, started fidelity monitoring
WIHA Package for National Dissemination

Implementation Structure: Train the Trainer Model

- Faculty Trainer – at WIHA
- Master Trainer trains Stepping On leader
- Leader: professional working with older adults
- Leader trains peer leader
Ensuring Success With Dissemination

- **Organization disseminating Stepping On (WIHA)**
  - Has connections and access to resources (local, state, national)
  - Has the mission and capacity - Dissemination fits with WIHA’s mission
  - Trains and monitors competence of new leaders
    - Falls prevention: Quiz
    - Exercise: Demonstrate competence
    - Adult facilitation: Quiz and demonstrate
    - Fidelity coaching: Observe and give feedback on leader’s teaching
  - Assists local organizations
    - Site implementation guide
    - Site readiness checklist
    - Technical assistance with implementation
    - Materials for advertising, participant recruitment available on WIHA website
Ensuring Success With Dissemination

- Organizations **taking up** Stepping On:
  - Identify leader before training:
    - Has worked with seniors
    - GOOD Knowledge of facilitation skills
    - Professional background that matches delphi
  - Commit to adoption, implementation, maintenance, local spread
Developing interventions for the community setting:

Design for dissemination
Community-based participatory research

Researcher and community partner together design intervention

<table>
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<th>Community Partner</th>
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<tr>
<td>Science of what works, key elements</td>
<td>Knowledge of what is feasible to implement and maintain</td>
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<tr>
<td>Science of who should be in target group</td>
<td>Knowledge of target group – who, what, where, when</td>
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Same models and evaluation metrics can apply in intervention development

- Model for intervention development
  - Integrative, interactive model
  - CFIR

- Framework for evaluation
  - RE–AIM

- Goals:
  - Develop intervention that is likely to be feasible to implement and disseminate
  - Speed the time required to get intervention from development to practice
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<td>Long term commitment</td>
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<td>Hidden costs</td>
<td>Provide results</td>
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<tr>
<td>Research constraints overwhelming</td>
<td>Educate academic partner on community partner needs</td>
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<td>Be transparent and complete</td>
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<td>Start with the goal</td>
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<td>Simplify explanations</td>
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Adaptation and Fidelity
Balance or not?
## RE-AIM Framework: enhance quality and public health impact of dissemination

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Adaptation – why?

- Easier for organization to pick up and implement program or practice change (eg cheaper, less training, less complex)
- Intervention can reach more people (eg by telephone instead of face-to-face)
- Organization more likely to sustain it (less complex, lower cost)
Adaptation – when?

- Different populations
  - Rural – urban
  - Caucasian – African–American – Hispanic
  - High – low health literacy

- Different settings
  - Health care organization – community setting
  - Senior center – senior apartment complex

- Different payment mechanisms
  - Medicare FFS – ACO – community organization
Adaptation – What?

- Knowledge base – published literature
- Self-report – organization
  - Would you be likely to implement this? Why or why not?
  - What would need to change to make it feasible?
- Self-report – consumers/patients
  - Would you be likely to attend/use?
  - What would need to change?
Determining adaptations:
- Surveys/focus groups
- Design team – includes content experts and stakeholders
- Pilot testing

Measuring effect of adaptations:
- RE–AIM metrics
Fidelity – why?

Fidelity = the degree to which an intervention is delivered as intended

- Too much adaptation – lose effectiveness
  - Content omitted
  - Intervention shortened
  - Less trained people deliver intervention
Intervention black box – content, process, target group

- **Content**: key elements related to content of intervention
  - eg certain antibiotics work for pneumonia

- **Process** – Key elements related to process by which intervention is delivered
  - eg antibiotics within 4 hours of ER admission

- **Target group** – Who is getting the intervention?
  - eg outpatient tx for pneumonia effective for some but not all subgroups

Change to any of these areas can make intervention ineffective
Fidelity – How?

- Determine key elements
  - Items that cannot be changed without jeopardizing effect
  - Consider content, process, target group elements

- Methods
  - Program developer
  - Content experts
  - Delphi consensus
Fidelity – What to measure?

- **Intervention Delivery**
  - Competence = skillfulness of delivery
  - Adherence = done according to protocol

- **Evaluation Methods**
  - Observation, checklist of key elements – gold standard
    - In person, video recording, audio recording
    - Inter-rater reliability
  - Role-play, skills testing at end of training
    - Can be assessed by trainer
    - Doesn’t tell you what’s happening in real life
Fidelity – What to measure? (cont)

- Receipt of intervention
  - Do participants understand intervention?
  - Can they do it?

- Measure during intervention
  - Pre- and posttests
  - Can you show me what you learned?

- If intervention is delivered competently but not received, then may need adaptation for target group
Fidelity – what to measure (cont)

- **Enactment of treatment skills** = extent to which a patient actually implements a specific treatment in his/her daily life
  - Questionnaires, self-reports, structured follow-up interviews
  - Electronic monitoring of behavior
  - Biologic markers associated with desired behavior
# Fidelity lapses and solutions

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<th>Solutions</th>
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<td>Delivery competency</td>
<td>Improve training, coaching Evaluate pre-requisites for provider</td>
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<tr>
<td>Delivery adherence</td>
<td>Improve training, program manual Adapt program (too complex, etc)</td>
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Fidelity to Effectiveness

- Delivery
- Receipt
- Enactment
- Effectiveness
Summary

- D&I Research – definitions and purpose
- Innovation vs implementation strategies
- Two models for dissemination and implementation
- Model for evaluation: RE–AIM
- Choice of methods for data collection depends on the question; mixed methods are most useful
- Choice of control group depends on research question
- Example of Stepping On dissemination research
- Design for dissemination
- Balancing fidelity and adaptation