Introduction to RE-AIM

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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.
Defining success of implementation

- Effectiveness alone?
- Effectiveness plus broad reach?
- Feasibility to implement?
- Ability for organization to maintain it?
## RE–AIM Framework: enhance quality and public health impact of dissemination

<table>
<thead>
<tr>
<th>Metric</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach</td>
<td>Do you reach your intended audience?</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Is the intervention effective in practice?</td>
</tr>
<tr>
<td>Adoption</td>
<td>Do target settings/institutions adopt the intervention? How well and what are the barriers?</td>
</tr>
<tr>
<td>Implementation</td>
<td>What is the quality and consistency of intervention delivery?</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Are intervention effects maintained in people and settings over time?</td>
</tr>
</tbody>
</table>
Typically mixed methods

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<tr>
<td>Reach</td>
<td>Who partakes compared to those not partaking, % of target group partaking, reasons for taking part or not</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Pre-post measures, often intermediate not distal</td>
</tr>
<tr>
<td>Adoption</td>
<td>% of institutions adopting, reasons for/against</td>
</tr>
<tr>
<td>Implementation</td>
<td>Fidelity; cost; barriers and facilitators to implementation</td>
</tr>
<tr>
<td>Maintenance</td>
<td>% of institutions continuing to implement; reasons for/against</td>
</tr>
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</table>
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. Choosing the question requires:
   • Knowledge of intervention’s actual (or anticipated) dissemination and/or implementation.
   • Community input
Using the RE-AIM framework

1. All constructs contribute to ultimate impact of an intervention
   - Reach
   - Adoption
   - Implementation
   - Maintenance
   - Effectiveness

- You may focus on one construct more than another, depending on the research question.
- Program adaptation to improve one metric may worsen another, so consider need to evaluate all
Adaptation and Fidelity Balance or not?

Adaptation

Fidelity
## RE–AIM Framework: enhance quality and public health impact of dissemination

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The question drives the evaluation

- 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
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: Examine RE–AIM metrics of intervention with different delivery models
  - 3 different settings, 2 different types of program leaders
Research questions

- Does dissemination differ by:
  - Site (Senior apts, Parks and Rec Center, Parish Nurse Program)
  - Health professional vs non-health professional

- Characteristics
  - Program reach
  - Organizational adoption, implementation and maintenance
  - Implementation fidelity
  - Participant uptake of program
Step 3 - Test intervention

- Compare different delivery models
  - Retirement community, senior center, parish nurse
  - Primarily interested in reach, but also in adoption, implementation, and maintenance

- Compare different backgrounds of leaders
  - RN versus social worker
  - Primarily interested in fidelity, but also adoption
Measures

- Participant Questionnaires
  - start and end of workshop
  - after home visit/phone call
  - one year post program

- Leader, Site Manager, Guest Experts Questionnaires and Interviews

- Fidelity Monitoring 3 of 7 sessions
## Sites: Participant Characteristics

<table>
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<tr>
<th></th>
<th>Senior Apts (39)</th>
<th>Parks and Rec Center (23)</th>
<th>Parish Nurse Site (21)</th>
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</thead>
<tbody>
<tr>
<td>Race/Ethnicity</td>
<td>97% W 3% B</td>
<td>100% W</td>
<td>100% W</td>
</tr>
<tr>
<td>Age</td>
<td>83.5</td>
<td>76.5</td>
<td>78.1</td>
</tr>
<tr>
<td>Female</td>
<td>82%</td>
<td>91%</td>
<td>90%</td>
</tr>
<tr>
<td>Using Assistive device</td>
<td>52%</td>
<td>17%</td>
<td>19%</td>
</tr>
<tr>
<td>Education &lt; high school</td>
<td>23%</td>
<td>4%</td>
<td>5%</td>
</tr>
<tr>
<td>Avg # of falls</td>
<td>1.28</td>
<td>0.87</td>
<td>0.52</td>
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More high risk group in senior apartments
### Program Reach among sites

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<tr>
<td>Race/Ethnicity</td>
<td>97% W 3% B Apts = unknown</td>
<td>100% W Waukesha = 12% Hispanic</td>
<td>100% W Church = 15% Hispanic</td>
</tr>
<tr>
<td>Female</td>
<td>82% Apts = 78% female</td>
<td>91% Center = 85% female</td>
<td>90% Church = 60% female</td>
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**Summary:**
- Men and minorities underrepresented in workshops
Site Differences in Adoption, Implementation, and Maintenance

- Burden highest at Senior Apts
  - Competing demands on staff
  - Not used to offering workshops
- Rec center and parish nurse programs planned to continue offering Stepping On
  - Rec center has offered it 5 times over 2 years
  - Parish nurse twice
  - Senior apts, none
### Health Professional vs Non-health Professional: Fidelity

- Health professional = RN at senior apts.
- Non-health professional = Case Manager
- Evaluated second workshop
- 4 domains, each item in each domain rated 0-4 scale
  - 0 = not done
  - 1 = not satisfactory
  - 2 = satisfactory
  - 3 = very good
  - 4 = excellent
- Scores averaged for all items in domain

<table>
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<tr>
<th>Fidelity Domains</th>
<th>HP Score</th>
<th>NHP Score</th>
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<tr>
<td>Non-Exercise Components</td>
<td>2.7</td>
<td>2.8</td>
</tr>
<tr>
<td>Exercise Components</td>
<td>3.4</td>
<td>3.2</td>
</tr>
<tr>
<td>Physical Therapy Components</td>
<td>3.4</td>
<td>3.1</td>
</tr>
<tr>
<td>Global Leader Quality</td>
<td>3.4</td>
<td>2.7</td>
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- Both HP and NP had scores satisfactory to good
- HP tended to score higher, biggest difference in global leader quality
Health Professional vs Non-health Professional: Specific elements

Non-health professional lapses in fidelity:
- Link exercises to how they prevent falls
- Adequate knowledge of falls prevention topics
- Prompt guest PT
- Use preventive framework

Summary
- Non-health professional scores satisfactory to good
- There were specific areas of weakness that could be related to background
Conclusions

- Stepping On feasible in variety of settings
  - More feasible to implement in Parks and Rec Center and Parish Nurse Program compared to Senior Apts bldg, but former sites may not reach those most at risk
  - Men and minorities not well reached
    - Additional research needed on how to recruit men, minorities, and on role of physician in recruitment
Conclusions, continued

- Stepping On fidelity (quality) may be slightly less when led by non-health professional compared to health professional
  - Given need for leaders in community setting, results suggest non-health professional has adequate quality
  - We have strengthened training in areas where non-health professional may be weaker
  - Fidelity monitoring is essential for all new leaders
Summary

- 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
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Adaptation – why?

- Easier for organization to pick up and implement program or practice change (e.g., cheaper, less training, less complex)
- Intervention can reach more people (e.g., 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
  - Define key elements – elements that cannot be adapted
- 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?
Adaptation – How?

- 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
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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<tr>
<td>Delivery competency</td>
<td>Improve training, coaching</td>
</tr>
<tr>
<td></td>
<td>Evaluate pre-requisites for provider</td>
</tr>
<tr>
<td>Delivery adherence</td>
<td>Improve training, program manual</td>
</tr>
<tr>
<td></td>
<td>Adapt program (too complex, etc)</td>
</tr>
<tr>
<td>Receipt of intervention</td>
<td>Inappropriate target group, or needs adaptation for target group</td>
</tr>
<tr>
<td>Enactment of intervention skills</td>
<td>Inappropriate target group, or needs adaptation for target group</td>
</tr>
</tbody>
</table>
Fidelity to Effectiveness

Fidelity

Delivery | Receipt | Enactment | Effectiveness
References

- RE-AIM.org  [www.re-aim.org](http://www.re-aim.org) Tools and resources to facilitate implementation; list with links of RE-AIM publications and presentations

- [https://ictr.wisc.edu/DnIResources](https://ictr.wisc.edu/DnIResources) ICTR webpage with more D&I resources