RE-AIM Plus:
Expanding the RE-AIM Framework for Real-time Program Evaluation

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3T’s Road Map: The Need for Implementation Research

Basic Biomedical Science

Key T1 activities to test what care works
- Clinical efficacy research

Clinical Efficacy Knowledge

Key T2 activities to test who benefits from promising care
- Outcomes research
- Comparative effectiveness research
- Health services research

Clinical Effectiveness Knowledge

Key T3 activities to test how to deliver high-quality care reliably and in all settings
- Measurement and accountability of healthcare quality and cost
- Implementation of interventions and healthcare system redesign
- Scaling and spread of effective interventions
- Research in above domains

Improved healthcare quality & value & population health
RE-AIM:
Measures the robustness, or consistency of effects across settings and patient subgroups

- Glasgow’s RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) framework is designed to assess interventions’ translatability to diverse, real-world participants and settings. (cite Glasgow 1999)

- Emphasis is on external validity
  - Are measures consistent across settings?
## RE-AIM: Five Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Description</th>
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</table>
| **Reach**       | Number, percentage and representativeness of eligible patients who participated in the intervention.  
                    • Is the intervention reaching the target population?  
                    Those most in need? |
| **Effectiveness** | Intervention effects on targeted outcomes,  
                     • Does the intervention accomplish its goals? |
| **Adoption**    | Number, percentage and representativeness of participating settings and providers.  
                     • To what extent are those targeted to deliver the intervention participating? |
| **Implementation** | The extent to which the intervention was consistently implemented by staff members. |
| **Maintenance** | The extent to which an intervention becomes part of routine organizational practices, and maintains effectiveness. |
What do qualitative methods add to implementation evaluation?

- Use open-ended techniques, e.g., interviews, observation
  - Goal is understanding, rather than measurement.

- Get into the “black box”
  - Uncover the whys and hows behind quantitative measures.
  - Identify and understand implementation processes, how they are influenced by context, and how they affect implementation success.
How are qualitative methods used in implementation evaluation?

- **Pre-Implementation**
  - Formative Evaluation
  - Tailor Intervention to each site

- **During Implementation**
  - Formative Evaluation
  - Improve & Adjust Implementation

- **Post Implementation**
  - Interpretive Evaluation
  - Explain summative evaluation results
  - Evaluate Sustainability & Dissemination prospects
RE-AIM Plus: Goals

- We developed RE-AIM Plus as part of an evaluation plan for our Medication Adherence and Intensification study.

- We added a qualitative component to the RE-AIM framework to create a tool that would systematically and rigorously:
  - Improve implementation in real time
  - Retrospectively explain differences in outcomes across sites
  - Provide guidance to future sites that may adopt the intervention
Adherence & Intensification of Medications for Diabetes Patients with Hypertension (AIM)

- Cluster randomized intervention trial
  - 3 VA sites: 2 large academically-affiliated, 1 community-based clinic
  - 15-month intervention period

- Goal: improve medication adherence and blood pressure control in patients with HTN and diabetes

- Pro-active identification of eligible patients using administrative data
  - Pharmacists given a prioritized list from which to contact and recruit patients
Adherence & Intensification of Medications for Diabetes Patients with Hypertension (AIM)

- Clinical pharmacist-based
  - Trained in motivational interviewing
  - Used computerized Medication Management Tool (MMT) to track recruitment and guide and document patient encounters.
    - Patients report home blood pressure measurements
    - Pharmacist and patient identify barriers to adherence and create action plans
Development of RE-AIM *Plus*

- We systematically reviewed each RE-AIM dimension, and created open-ended questions in each dimension.
  - Added information sources and data analyses that we’d use to address these questions.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Quantitative Measures</th>
<th>Qualitative Inquiry</th>
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<tbody>
<tr>
<td>Reach</td>
<td></td>
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<tr>
<td>Effectiveness</td>
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<td>Adoption</td>
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<td>Implementation</td>
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<td>Maintenance</td>
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Multiple Data Sources

Quantitative:
- Administrative data
- Medication management tool

Qualitative:
- Semi-structured interviews with Key Informants, including AIM Pharmacists
- Semi-structured interviews with patients
- Site visits and observations
- Medication management tool
- Webinars with AIM Pharmacists (biweekly)
- Motivational interview evaluation
- E-mails
## RE-AIM Plus: Reach

### QUANTITATIVE MEASURES

- How many and what proportion of the target population is being contacted and participating in the intervention?

  - Measures
    - \# eligibles contacted/\# eligibles
    - \# eligibles participating/\# eligibles

- Use measures to track patient contact and participation weekly

- Look at variation across sites.

- Data Source
  - Medication Management Tool (MMT)

### QUALITATIVE INQUIRY

- What explains variation across sites?
- What are the factors and processes underlying barriers to contacting patients and patient participation, and how do we address them?

**Data Sources:**
- Semi-structured interviews with Key Informants, including AIM Pharmacists
- Site visits and observations
- Webinars with AIM Pharmacists (biweekly)
- E-mails between stakeholders and research staff
## RE-AIM Plus: Effectiveness

<table>
<thead>
<tr>
<th>QUANTITATIVE MEASURES</th>
<th>QUALITATIVE INQUIRY</th>
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</thead>
<tbody>
<tr>
<td>Evaluate the effects of the intervention on BP, glycemic, and lipid control in eligible patients.</td>
<td>Explain summative outcomes</td>
</tr>
<tr>
<td><strong>Measure:</strong></td>
<td></td>
</tr>
<tr>
<td>■ Relative change in systolic blood pressure measurements over time.</td>
<td>■ What are the conditions and mechanisms that lead to effectiveness?</td>
</tr>
<tr>
<td><strong>Data Source</strong></td>
<td>■ Why did the intervention work? Why not?</td>
</tr>
<tr>
<td>■ Administrative Data</td>
<td>■ What explains variation across sites?</td>
</tr>
<tr>
<td></td>
<td>■ What are the factors and processes underlying barriers to implementation, and how did we address them?</td>
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</tbody>
</table>

Data Sources: All
## RE-AIM PLUS: Adoption

<table>
<thead>
<tr>
<th>QUANTITATIVE MEASURES</th>
<th>QUALITATIVE INQUIRY</th>
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<tbody>
<tr>
<td><strong>What is the percentage of providers participating in the program?</strong></td>
<td><strong>Why don’t providers participate?</strong> How engaged are providers?</td>
</tr>
<tr>
<td><strong>Measure</strong></td>
<td><strong>Data Sources:</strong></td>
</tr>
<tr>
<td>• Providers participating/providers asked to participate.</td>
<td>• Semi-structured interviews with Key Informants, including AIM Pharmacists</td>
</tr>
<tr>
<td><strong>Data Source</strong></td>
<td>• Site visits and observations</td>
</tr>
<tr>
<td>• Primary care clinics</td>
<td>• Webinars with AIM Pharmacists (biweekly)</td>
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<td></td>
<td>• E-mails</td>
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<td>QUALITATIVE INQUIRY</td>
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<tr>
<td><strong>Implementation:</strong></td>
<td><strong>Pre-implementation:</strong></td>
</tr>
<tr>
<td>Did enrolled patients report home blood pressure readings?</td>
<td>What are site-specific issues that might influence implementation? What modifications do we need to make and how do we make them?</td>
</tr>
<tr>
<td>Measures</td>
<td>Implementation:</td>
</tr>
<tr>
<td>% of enrolled patients with reported home BPs among those who have a cuff</td>
<td>What were the problems with key implementation processes?</td>
</tr>
<tr>
<td>% of enrolled patients with action plans</td>
<td>What are the barriers to reporting home blood pressure readings?</td>
</tr>
<tr>
<td>Data Source</td>
<td>Review of CFIR domains</td>
</tr>
<tr>
<td>Medication Management Tool (MMT)</td>
<td>Data Sources: all</td>
</tr>
</tbody>
</table>
## RE-AIM PLUS: Maintenance

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<tr>
<th>QUANTITATIVE MEASURES</th>
<th>QUALITATIVE INQUIRY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Is the program maintained after the study period?</strong></td>
<td>Can the program be sustained after the study period?</td>
</tr>
<tr>
<td>Measures: None</td>
<td>What is the feasibility of retaining program-specific staff to continue the intervention?</td>
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<tr>
<td></td>
<td>What is the perception of program value among stakeholders?</td>
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Formative Evaluation Before Intervention: Implementation Dimension

- Site visit assessments: Sites had different procedures for distributing BP cuffs that would affect timeliness of delivery to patients
- Worked with sites and pharmacist to tailor procedures to each site
- Few problems with distribution during intervention
Formative Evaluation During Intervention: Reach Dimension

- Quantitative measure: Significant difference in # of eligibles contacted by Pharmacist A (sites 1 and 2) vs. Pharmacist B (site 3)

- Systems issues, especially lack of permanent workspace at sites 1 and 2, caused significant inefficiencies for Pharmacist A.
  - Worked with clinic staff on space issue but this did not improve.

- Spent more time on encounters and did more frequent follow-up
  - Reviewed work processes with pharmacist, set recruitment goals, provided opportunities to exchange experiences with other pharmacists
Apply lessons learned to future sites

- Review key processes before intervention
- Improve packaging of intervention, e.g., structure and goals
- Identify space issues before implementation and develop strategies for surmounting them
- Provide problem-solving support to pharmacist
Conclusions

RE-AIM *Plus*:

- Useful in generating context-specific and generalizable information on implementation of interventions.
- Allows understanding of implementation mechanisms behind both process and outcome measures.
- May improve ways to adapt implementation in real time and to increase the likelihood of success when interventions are disseminated.
Conclusions

Methods:

- Effective procedures and instruments to systematically collect data
- Multiple data sources
- Data management system to facilitate data retrieval
  - Including real time