

# Models and Frameworks for D&I Research

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# Objectives

- By the end of this lecture, learners will be able to...
  - Describe the level of evidence necessary to recommend dissemination and implementation of an innovation
  - Explain the state of D&I models within the field
  - Describe the components of the consolidated framework for implementation research
  - Apply a D&I model to a selected public health innovation

# When is an innovation ready to be disseminated and implemented?

- In a perfect world...
  - We'd have a systematic review of the evidence for an innovation
- In a less perfect world...
  - We would at least have a successful effectiveness study
- In reality, things are complicated



# Frameworks that can guide Dissemination & Implementation Research



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## Bridging Research and Practice:

### Models for Dissemination and Implementation Research

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### Abstract

**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 socio-ecological 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/contained 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.



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## A Thematic Analysis of Theoretical Models for Translational Science in Nursing: Mapping the Field

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### Abstract

**Background**—The quantity and diversity of conceptual models in translational science may complicate rather than advance the use of theory.

**Purpose**—This paper offers a comparative thematic analysis of the models available to inform knowledge development, transfer, and utilization.

**Method**—Literature searches identified 47 models for knowledge translation. Four thematic areas emerged: (1) evidence-based practice and knowledge transformation processes; (2) strategic change to promote adoption of new knowledge; (3) knowledge exchange and synthesis for application and inquiry; (4) designing and interpreting dissemination research.

**Discussion**—This analysis distinguishes the contributions made by leaders and researchers at each phase in the process of discovery, development, and service delivery. It also informs the selection of models to guide activities in knowledge translation.

**Conclusions**—A flexible theoretical stance is essential to simultaneously develop new knowledge and accelerate the translation of that knowledge into practice behaviors and programs of care that support optimal patient outcomes.

### Keywords

Translational science; evidence-based practice; knowledge translation; dissemination research; theory



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Wilson et al. Implementation Science 2010, 5:91  
http://www.implementationscience.com/content/5/1/91



SYSTEMATIC REVIEW

Open Access

Bridging Research and Practice:  
Models for Dissemination and Implementation

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Disseminating research findings: what should researchers do? A systematic scoping review of conceptual frameworks

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Abstract

**Context**—Theories and frameworks (hereafter called dissemination and implementation (D&I) research) by making the systematic scoping review. This work organizes and synthesizes these models in D&I research; (2) synthesizing this information into a model to inform study design and execution.

**Evidence acquisition**—This review began with a search of the literature and used snowball sampling to collect models developed in presentations, and books. All models were analyzed using author-defined variables: construct flexibility, focus on dissemination (D/I), and the socio-ecological framework. The SEF scale ranged from broad to operational to implementation-focused. All SEF levels (systemic, organizational, and individual) applicable to a model were also extracted. Models were categorized by SEF level.

**Evidence synthesis**—Sixty-one models were identified across all SEF categories in the construct flexibility and D/I scale. The SEF levels were distributed across all levels of the SEF; the fit between SEF level and model type was good. To assist researchers in selecting and utilizing a model, we present and explain examples of how models are used in practice.

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

Abstract

**Background:** Addressing deficiencies in the dissemination and transfer of research-based knowledge into routine clinical practice is high on the policy agenda both in the UK and internationally. However, there is lack of clarity between funding agencies as to what represents dissemination. Moreover, the expectations and guidance provided to researchers vary from one agency to another. Against this background, we performed a systematic scoping to identify and describe any conceptual/organising frameworks that could be used by researchers to guide their dissemination activity.

**Methods:** We searched twelve electronic databases (including MEDLINE, EMBASE, CINAHL, and PsycINFO), the reference lists of included studies and of individual funding agency websites to identify potential studies for inclusion. To be included, papers had to present an explicit framework or plan either designed for use by researchers or that could be used to guide dissemination activity. Papers which mentioned dissemination (but did not provide any detail) in the context of a wider knowledge translation framework, were excluded. References were screened independently by at least two reviewers; disagreements were resolved by discussion. For each included paper, the source, the date of publication, a description of the main elements of the framework, and whether there was any implicit/explicit reference to theory were extracted. A narrative synthesis was undertaken.

**Results:** Thirty-three frameworks met our inclusion criteria, 20 of which were designed to be used by researchers to guide their dissemination activities. Twenty-eight included frameworks were underpinned at least in part by one or more of three different theoretical approaches, namely persuasive communication, diffusion of innovations theory, and social marketing.

**Conclusions:** There are currently a number of theoretically-informed frameworks available to researchers that can be used to help guide their dissemination planning and activity. Given the current emphasis on enhancing the uptake of knowledge about the effects of interventions into routine practice, funders could consider encouraging researchers to adopt a theoretically-informed approach to their research dissemination.

Theoretical Models for Translational  
Research: Bridging the Field

Wilson<sup>1</sup>, Cheryl A. Fisher, RN-BC, EdD<sup>1</sup>, Clare E. Hastings, PhD<sup>1</sup>, and Gwennyth R. Wallen, RN, PhD<sup>1</sup>  
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The diversity of conceptual models in translational science may impede the development of a unified theory.

A narrative thematic analysis of the models available to inform translational research was conducted.

Forty-seven models for knowledge translation. Four thematic areas emerged: (1) knowledge translation processes; (2) strategic knowledge; (3) knowledge exchange and synthesis for knowledge translation; and (4) knowledge translation and interpreting dissemination research.

This synthesis highlights the contributions made by leaders and researchers at the intersection of research, development, and service delivery. It also informs the development of a unified theory in knowledge translation.

Knowledge translation is essential to simultaneously develop new knowledge and disseminate that knowledge into practice behaviors and programs that improve health outcomes.

Keywords: knowledge translation; dissemination research; translational 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

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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.

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# Why do we choose a certain model?

Most important criteria in a survey of implementation researchers and practitioners:

- Empirical support
- Explanatory power/testability
- Applicability to setting
- Description of change process
- Analytic level

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

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

Model	Dissemination and/or implementation	Construct flexibility: broad to operational	Socioecologic Level					References
			System	Community	Organization	Individual	Policy	
Diffusion of Innovation	D-only	1		x	x	x		21
RAND Model of Persuasive Communication and Diffusion of Medical Innovation	D-only	1		x	x	x		22
Effective Dissemination Strategies	D-only	2		x	x	x		23
Model for Locally Based Research Transfer Development	D-only	2		x	x			24
Streams of Policy Process	D-only	2	x	x	x		x	25, 26
A Conceptual Model of Knowledge Utilization	D-only	3	x	x			x	27
Conceptual Framework for Research Knowledge Transfer and Utilization	D-only	3			x			28
Conceptualizing Dissemination Research and Activity: Canadian Heart Health Initiative	D-only	3		x	x			29, 30
Policy Framework for Increasing Diffusion of Evidence-Based Physical Activity Interventions	D-only	3	x	x	x		x	31

# Dissemination & Implementation Models in Health Research & Practice

## Need Help?

[Tutorial](#)[FAQ](#)[Glossary](#)[Contact Us](#)[Home](#)[Resources](#)[Submit Models](#)[About Us](#)

Google™ Custom Se



This interactive website was designed to help researchers and practitioners to select the D&I Model that best fits their research question or practice problem, adapt the model to the study or practice context, fully integrate the model into the research or practice process, and find existing measurement instruments for the model constructs. The term 'Models' is used to refer to both theories and frameworks that enhance dissemination and implementation of evidence-based interventions more likely.

## Select

Search, view, and select D&I Models

## Adapt

Read strategies for adapting D&I Models to research or practice context

## Integrate

Read strategies for incorporating D&I Models into the full spectrum of your project

## Measure constructs

Find a list of constructs and links to measurement tools associated with the D&I Models

## in Health Research & Practice

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[View All D&I Models](#)[Search D&I Models](#)[Select](#)[Adapt](#)[Integrate](#)[Measure constructs](#)

User Name

Password

[Login](#)[Register](#)

## Search D&I Models

You can search for D&I Models by entering a keyword OR by selecting from the categories below.

Enter keyword for model search:

[Submit Keyword Search](#)

OR

Dissemination & Implementation Models can be searched using individually set criteria.

### D And/Or I

- Dissemination Only
- Implementation Only
- Any

### Socio-Ecological Levels

- Individual
- Organization
- Community
- System
- Policy
- All

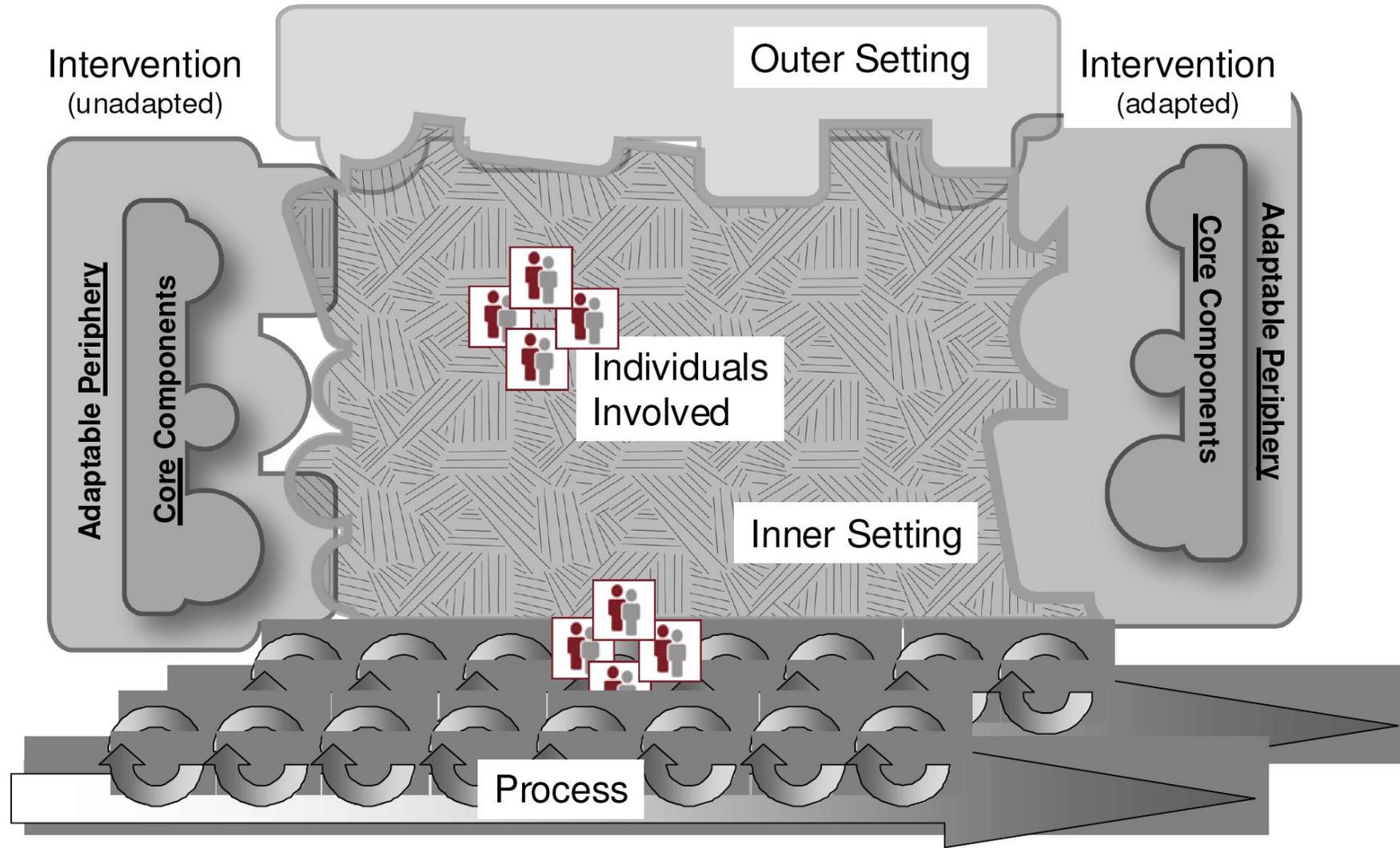
### Constructs

- Acceptability/feasibility
- Awareness
- Communication
- Context
- Development of an intervention
- Barriers and facilitators
- Communication channels
- Complexity
- Context - Inner setting

## [Searchable website](http://dissemination-implementation.org/index.aspx)

<http://dissemination-implementation.org/index.aspx>

# Consolidated Framework for Implementation Research



Damschroder, L.J., et al., *Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science*. *Implement Sci*, 2009. 4: p. 50.

# CFIR domains

- Intervention characteristics
- Outer setting
- Inner setting
- Characteristics of individuals
- Process

# CFIR: Intervention

I. INTERVENTION CHARACTERISTICS		
A	Intervention Source	Perception of key stakeholders about whether the intervention is externally or internally developed.
B	Evidence Strength & Quality	Stakeholders' perceptions of the quality and validity of evidence supporting the belief that the intervention will have desired outcomes.
C	Relative Advantage	Stakeholders' perception of the advantage of implementing the intervention versus an alternative solution.
D	Adaptability	The degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs.
E	Trialability	The ability to test the intervention on a small scale in the organization, and to be able to reverse course (undo implementation) if warranted.
F	Complexity	Perceived difficulty of implementation, reflected by duration, scope, radicalness, disruptiveness, centrality, and intricacy and number of steps required to implement.
G	Design Quality & Packaging	Perceived excellence in how the intervention is bundled, presented, and assembled.
H	Cost	Costs of the intervention and costs associated with implementing the intervention including investment, supply, and opportunity costs.

# CFIR: Outer setting

II. OUTER SETTING		
A	Patient Needs & Resources	The extent to which patient needs, as well as barriers and facilitators to meet those needs, are accurately known and prioritized by the organization.
B	Cosmopolitanism	The degree to which an organization is networked with other external organizations.
C	Peer Pressure	Mimetic or competitive pressure to implement an intervention; typically because most or other key peer or competing organizations have already implemented or are in a bid for a competitive edge.
D	External Policy & Incentives	A broad construct that includes external strategies to spread interventions, including policy and regulations (governmental or other central entity), external mandates, recommendations and guidelines, pay-for-performance, collaboratives, and public or benchmark reporting.

# CFIR: Inner setting

III. INNER SETTING		
A	Structural Characteristics	The social architecture, age, maturity, and size of an organization.
B	Networks & Communications	The nature and quality of webs of social networks and the nature and quality of formal and informal communications within an organization.
C	Culture	Norms, values, and basic assumptions of a given organization.
D	Implementation Climate	The absorptive capacity for change, shared receptivity of involved individuals to an intervention, and the extent to which use of that intervention will be rewarded, supported, and expected within their organization.
1	Tension for Change	The degree to which stakeholders perceive the current situation as intolerable or needing change.
2	Compatibility	The degree of tangible fit between meaning and values attached to the intervention by involved individuals, how those align with individuals' own norms, values, and perceived risks and needs, and how the intervention fits with existing workflows and systems.
3	Relative Priority	Individuals' shared perception of the importance of the implementation within the organization.
4	Organizational Incentives & Rewards	Extrinsic incentives such as goal-sharing awards, performance reviews, promotions, and raises in salary, and less tangible incentives such as increased stature or respect.

# CFIR: Inner setting

5	Goals and Feedback	The degree to which goals are clearly communicated, acted upon, and fed back to staff, and alignment of that feedback with goals.
6	Learning Climate	A climate in which: a) leaders express their own fallibility and need for team members' assistance and input; b) team members feel that they are essential, valued, and knowledgeable partners in the change process; c) individuals feel psychologically safe to try new methods; and d) there is sufficient time and space for reflective thinking and evaluation.
E	Readiness for Implementation	Tangible and immediate indicators of organizational commitment to its decision to implement an intervention.
1	Leadership Engagement	Commitment, involvement, and accountability of leaders and managers with the implementation.
2	Available Resources	The level of resources dedicated for implementation and on-going operations, including money, training, education, physical space, and time.
3	Access to Knowledge & Information	Ease of access to digestible information and knowledge about the intervention and how to incorporate it into work tasks.

# CFIR: Individuals

IV. CHARACTERISTICS OF INDIVIDUALS		
A	Knowledge & Beliefs about the Intervention	Individuals' attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention.
B	Self-efficacy	Individual belief in their own capabilities to execute courses of action to achieve implementation goals.
C	Individual Stage of Change	Characterization of the phase an individual is in, as he or she progresses toward skilled, enthusiastic, and sustained use of the intervention.
D	Individual Identification with Organization	A broad construct related to how individuals perceive the organization, and their relationship and degree of commitment with that organization.
E	Other Personal Attributes	A broad construct to include other personal traits such as tolerance of ambiguity, intellectual ability, motivation, values, competence, capacity, and learning style.

# CFIR: Process

V. PROCESS		
A	Planning	The degree to which a scheme or method of behavior and tasks for implementing an intervention are developed in advance, and the quality of those schemes or methods.
B	Engaging	Attracting and involving appropriate individuals in the implementation and use of the intervention through a combined strategy of social marketing, education, role modeling, training, and other similar activities.
1	Opinion Leaders	Individuals in an organization who have formal or informal influence on the attitudes and beliefs of their colleagues with respect to implementing the intervention.
2	Formally Appointed Internal Implementation Leaders	Individuals from within the organization who have been formally appointed with responsibility for implementing an intervention as coordinator, project manager, team leader, or other similar role.
3	Champions	"Individuals who dedicate themselves to supporting, marketing, and 'driving through' an [implementation]" [101] (p. 182), overcoming indifference or resistance that the intervention may provoke in an organization.
4	External Change Agents	Individuals who are affiliated with an outside entity who formally influence or facilitate intervention decisions in a desirable direction.
C	Executing	Carrying out or accomplishing the implementation according to plan.
D	Reflecting & Evaluating	Quantitative and qualitative feedback about the progress and quality of implementation accompanied with regular personal and team debriefing about progress and experience.

# The RE-AIM Framework



[www.re-aim.org](http://www.re-aim.org)

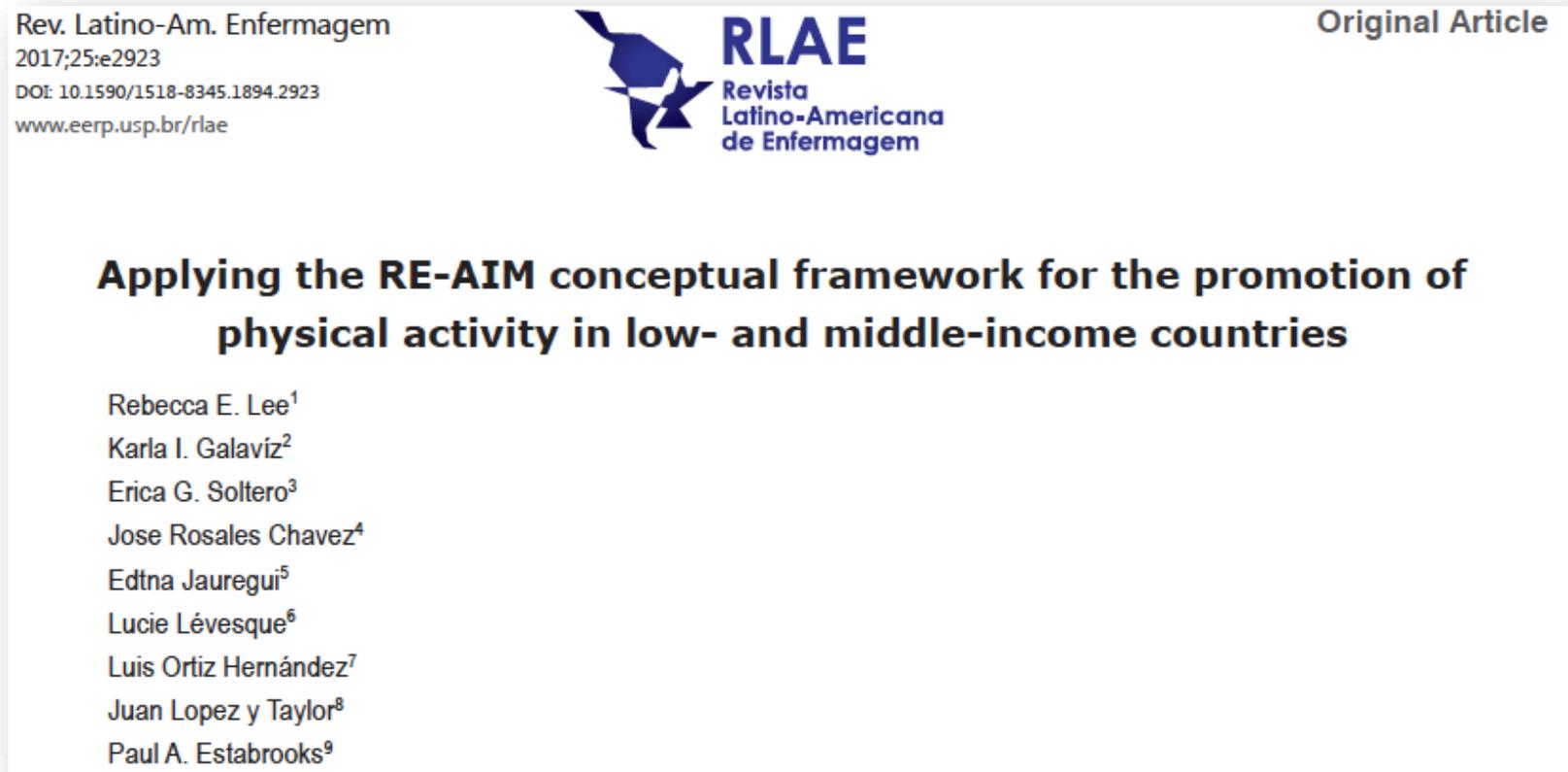
# The RE-AIM Framework

- Focus on enhancing:
  - Reach – Participation rates and representativeness
  - Effectiveness – Breadth (quality of life), including negative or unintended effects
  - Adoption - Setting and staff participation rate and representativeness
  - Implementation – Consistency, adaptation and costs of the program
  - Maintenance – Extent to which program and effects are sustained

# Why is this important? Impact of loss at each RE-AIM CONCEPT

Example of Translation of Interventions into Practice		
Dissemination Step	RE-AIM Concept	% Impact
50% of settings use intervention	Adoption	50.0%
50% of staff take part	Adoption	25.0%
50% of patients identified, accept	Reach	12.5%
50% follow regimen correctly	Implementation	6.2%
50% benefit from the intervention	Effectiveness	3.2%
50% continue to benefit after six months	Maintenance	1.6%

# Example of RE-AIM in action



The purpose of this manuscript is to describe the RE-AIM framework, the process and materials developed for a one-day workshop in Guadalajara, and the acceptability and satisfaction of participants that attended the workshop.

# RE-AIM components used in the development and implementation of the workshop

<b>Reach</b> 1. Method to identify target population 2. Inclusion criteria 3. Exclusion criteria 4. Participation rate 5. Representativeness
<b>Efficacy=effectiveness</b> 6. Measures=results for at least one follow-up 7. Intent-to-treat analysis utilized 8. Quality-of-life or potential negative outcomes 9. Percent attrition
<b>Adoption</b> 10. Description of intervention location 11. Description of staff who delivered intervention 12. Method to identify staff who delivered intervention 13. Level of expertise of delivery agent 14. Inclusion=exclusion criteria of delivery agent or setting 15. Adoption rate of delivery agent or Setting
<b>Implementation</b> 16. Intervention duration and frequency 17. Extent protocol delivered as intended (%) 18. Measures of cost of implementation
<b>Maintenance</b> 19. Assessed outcomes 2'6 months post intervention 20. Indicators of program-level maintenance 21. Measures of cost of maintenance

Figure 1 - RE-AIM components used in the development and implementation of the workshop.

Programs	Reach	Effectiveness	Adoption	Implementation	Maintenance
Chronic Disease					
<i>Setting:</i> 1 Rural clinic <i>Program:</i> 6 month diabetes management program that included physician counseling, weekly meetings with health educators, and a self-management plan.	500 patients were eligible and 100 participated. Men were more likely to participate.	Participants averaged a 1 point reduction in A1c, improved quality of life, and no unintended negative consequences.	100% of doctors and clinic health educator agreed to participate.	60% of the program was delivered as intended. Some health educator support sessions were not delivered because participants did not attend.	Participants maintained a 1-point reduction in A1c, after the program.
<i>Setting:</i> 1 University/10 Clinics <i>Program:</i> Clinics were randomized to a diabetes management program or standard care group. The diabetes management program included daily text-messages to report blood sugar levels and monthly support calls from health educators.	500 patients were eligible and 200 participated. Men and women were just as likely to participate.	Participants averaged a half point reduction in A1c and improved quality of life. Some participants complained about costs associated with text messages.	16 clinics were invited to participate and 8 joined. 70% of physicians agreed to participate and each provided a health educator.	75% of physicians regularly referred patients to the program. All text messaging and follow up via telephone was delivered as intended.	Participants maintained a half point reduction in A1c after the program.
Public Health					
<i>Setting:</i> 1 University/10 Clinics <i>Program:</i> 6 month weight loss program with nutrition counseling, a physical activity class, and monthly healthy eating newsletters.	Out of 300 patients, 200 were eligible and 50 participated. Younger patients and men were less likely to join.	80% of participants lost more than 5% of their body weight. Quality of life improved for all participants. No reports of unhealthy weight loss practices.	50% of doctors participated and a registered dietician was trained at each clinic.	75% of the program and 50% of the counseling was delivered as intended.  No cost data available.  <i>Time commitment:</i> Physicians =15 minutes/ participant Dietitians= 12 hours/participant Volunteers= 36 hours for 50 participants	75% of patients who lost weight maintained their new weight at 6 months follow up. Only the walking group was sustained beyond research study.
<i>Setting:</i> 1 University/ 10 Clinics <i>Program:</i> 6 month web-based weight loss program with goal setting, automated feedback and self-monitoring strategies.	Each clinic had 300 patients, 200 were eligible, and 75 participated. Men were less likely to join.	50% of participants lost more than 5% of their body weight and reported increased quality of life. One patient used unhealthy weight loss practices.	10 Clinics were invited to participate and 2 joined. 70% of physicians in each clinic participated.	70% of physicians regularly referred patients to the program. All internet-based activities were delivered as intended.  Participants received \$20 in monetary incentives.  <i>Time commitment:</i> Physicians =2 minutes/ participant Office staff= 1 hour/week	80% of patients who lost weight maintained their new weight at 6 months follow up. No organizational maintenance data available.

Program examples used for interactive activities to demonstrate RE-AIM constructs

Programs	Reach	Effectiveness
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Program examples used for interactive activities to demonstrate RE-AIM constructs

# Summary

- Several models and frameworks exist to guide D&I research
  - We probably don't need another one
- Existing models and frameworks can be tailored for use in specific settings using empirical data
- Organizational and behavior change theories can inform the application of these models and frameworks



**Questions?**