

Knowledge Exchange  
Provincial Addiction & Mental Health

# Implementation Science Theories, Models and Frameworks

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## About implementation science

Implementation science (IS) is “the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services and care” (Eccles & Mittman, 2006, p.1).

The use of IS theories, models or frameworks can provide users with a better understanding of how and why implementation is successful. Each tool has a distinct purpose.

### Key Terms

**Theory:** A set of principles or statements developed to *describe* and *explain* a phenomenon. An IS theory usually attempts to explain and predict how and why implementation is successful.

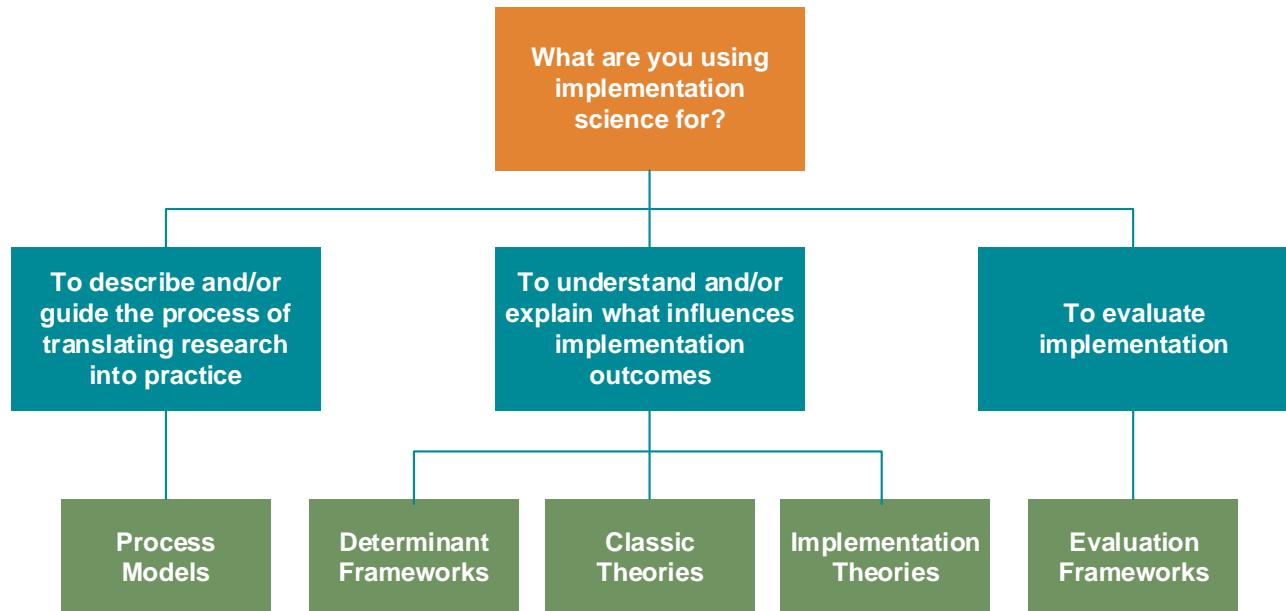
**Model:** A simplification of a theory – it attempts to *describe* and simplify a phenomenon but it is not explanatory. An IS model usually specifies steps in the process of translating research into practice.

**Framework:** *Describes* factors believed to influence an outcome. An IS framework usually lists and organizes factors found to influence aspects of IS (Nilsen, 2015). Unlike a theory or model, a framework tells you *what to pay attention to*, it does not tell you *how* or *what* to do.

According to Nilsen (2015), there are three overarching aims to the use of IS theories, models and frameworks:

- 1) To describe and/or guide the process of translating research into practice.
- 2) To understand and/or explain what influences implementation outcomes.
- 3) To evaluate implementation.

Based on these three aims, Nilsen (2015) proposed five categories to organize IS theories, models and frameworks. Note that there are considerable overlap between some of the categories (i.e., a determinant framework can also be used for evaluation).



## Key Terms



**Process models:** Describe the steps needed for translating research into practice.

**Determinant frameworks:** Describe factors that serve as barriers and facilitators to influence implementation outcomes.

**Classic theories:** Borrowed from fields outside of IS, such as psychology and organizational theory, and are applied to provide a better understanding and explanation of aspects of implementation.

**Implementation theories:** Developed by implementation researchers to specifically provide a better understanding and explanation of aspects of implementation.

**Evaluation frameworks:** Provide a structure to evaluate aspects of IS.

Once a theory, model or framework has been selected, it can be used to develop data collection approaches (e.g., interview guide) and as a guide for analyzing and interpreting data (Kirk et al., 2016). The most commonly used IS models, theories and frameworks are presented below (Birken et al., 2017).

# Theories, models, and frameworks

## Consolidated Framework for Implementation Research (CFIR)

<b>Prevalence<sup>1</sup></b>	20.6%	
<b>Description</b>	<p>The CFIR consists of 39 constructs across five domains that are associated with effective implementation of an intervention (see Appendix A). The five domains are:</p> <ol style="list-style-type: none"> <li>1. Characteristics of the intervention</li> <li>2. Inner setting (the context through which implementation will proceed)</li> <li>3. Outer setting (the context in which the organization resides)</li> <li>4. Characteristics of the individuals involved</li> <li>5. Implementation process</li> </ol>	
<b>Application</b>	<ul style="list-style-type: none"> <li>• Determinant framework.</li> <li>• Most commonly used to determine the impact of an intervention, considering why an intervention does or does not work.</li> <li>• Provides a practical guide to systematically assess potential barriers and facilitators prior to implementation.</li> </ul>	
<b>Strengths &amp; weaknesses</b>	<p><i>Strengths</i></p> <ul style="list-style-type: none"> <li>• Comprehensive in scope (unifies many existing models and frameworks).</li> <li>• Can be applied at any phases of the implementation (i.e., pre-, during, or post-implementation) (Kirk et al., 2016).</li> <li>• Can be adapted for use across settings.</li> </ul>	<p><i>Weaknesses</i></p> <ul style="list-style-type: none"> <li>• Has many constructs <ul style="list-style-type: none"> <li>○ Can be difficult to decide whether and at what level to apply constructs.</li> <li>○ Can be time-consuming and resource intensive to employ comprehensively.</li> </ul> </li> </ul>
<b>How it is used</b>	<ul style="list-style-type: none"> <li>• Assess each construct for importance and direction of influence.</li> <li>• Adapt and operationalize definitions of constructs.</li> <li>• Discern level(s) at which each construct should be evaluated.</li> <li>• Decide how to measure and assess each construct (tools and templates are available <a href="#">here</a>).</li> <li>• Consider best timing for measurement.</li> <li>• Document findings related to each construct.</li> </ul>	
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Tools, templates, and guides for using CFIR: <a href="#">The CFIR Guide</a></li> <li>• CFIR Research Team, 2019; Damschroder et al, 2019; Kirk et al. 2016</li> </ul>	

1. The proportion of implementation researchers and practitioners who have used a given implementation theory, model, or framework, as determined by survey by Birken et al. (2017).

## Reach, Effectiveness or Efficacy, Adoption, Implementation and Maintenance (RE-AIM)

<b>Prevalence<sup>1</sup></b>	13.9%	
<b>Description</b>	<p>The RE-AIM framework guides the evaluation of interventions by considering:</p> <ul style="list-style-type: none"> <li>▪ <b>Reach:</b> The number, proportion and representativeness of individuals who participated in the intervention.</li> <li>▪ <b>Effectiveness/efficacy:</b> The impact of the intervention on important outcomes, including potential negative effects.</li> <li>▪ <b>Adoption:</b> The number, proportion and representativeness of settings and staff who will adopt the intervention.</li> <li>▪ <b>Implementation:</b> The extent the intervention is implemented as intended.</li> <li>▪ <b>Maintenance:</b> The extent to which the intervention is sustained over time.</li> </ul> <p>Through these dimensions, the impact of interventions can be assessed at both the individual and organizational level (see Appendix B).</p>	
<b>Application</b>	<ul style="list-style-type: none"> <li>• Evaluation framework.</li> <li>• Most commonly used to evaluate the effectiveness of an intervention.</li> <li>• Can be used to compare two or more interventions across dimensions.</li> <li>• Can also be used as a planning tool to help design interventions.</li> </ul>	
<b>Strengths &amp; weaknesses</b>	<p><i>Strengths</i></p> <ul style="list-style-type: none"> <li>• Goes beyond evaluating whether an intervention is effective – also considers reach, adoption, implementation fidelity, and sustainability.</li> <li>• Equal emphasis on internal and external validity issues (Glasgow et al., 2010).</li> <li>• Emphasizes representativeness (Glasgow et al., 2010).</li> <li>• Can be adapted for use across settings.</li> </ul>	<p><i>Weaknesses</i></p> <ul style="list-style-type: none"> <li>• Not recommended for evaluating interventions that reaches only a few patients or is adopted by few settings.</li> </ul>
<b>How it is used</b>	<ul style="list-style-type: none"> <li>• Develop questions to ask about each RE-AIM dimension (measures and checklists are available <a href="#">here</a>).</li> <li>• Select data sources to answer each RE-AIM dimension.</li> </ul> <p>Example questions to ask:</p> <ul style="list-style-type: none"> <li>▪ <b>Reach:</b> What #, % and type of participants took part in the intervention?</li> <li>▪ <b>Effectiveness/efficacy:</b> What outcomes were improved? What were some unanticipated consequences?</li> <li>▪ <b>Adoption:</b> What #, % and type of settings and staff adopted the intervention?</li> <li>▪ <b>Implementation:</b> To what extent were the various intervention components delivered as intended?</li> <li>▪ <b>Maintenance:</b> What were the long-term (6-12 months) effects? To what extent were different components of the intervention continued?</li> </ul> <p>Each dimension is scored from 0 to 1. Overall impact = Reach x Effectiveness x Adoption x Implementation x Maintenance. For more on RE-AIM scoring, see <a href="#">here</a>.</p>	

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**Resources**

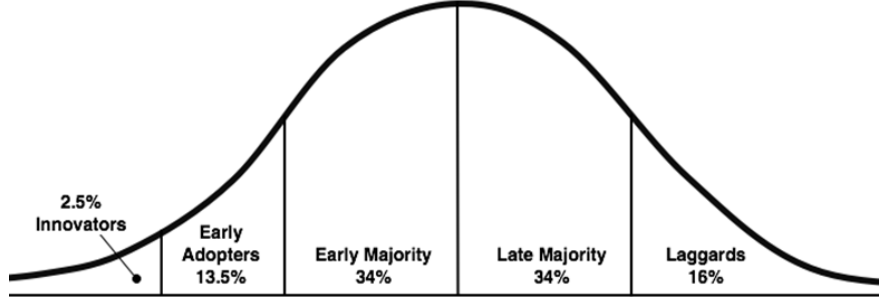
- Resources, tools, and an online training module for RE-AIM: [RE-AIM.org](https://www.re-aim.org/)
- Glasgow et al, 2010; Glasgow, Vogt & Boles, 1999



## Theoretical Domains Framework (TDF)

<b>Prevalence<sup>1</sup></b>	9.0%															
<b>Description</b>	<p>The TDF was developed from psychological and organizational behavioural change theories. The refined TDF consists of 84 constructs across 14 domains that are associated with behaviour change in implementation efforts (see Appendix C).</p> <p>The 14 domains are:</p> <table border="0"> <tr> <td>1. Knowledge</td> <td>8. Intentions</td> </tr> <tr> <td>2. Skills</td> <td>9. Goals</td> </tr> <tr> <td>3. Social/professional role and identity</td> <td>10. Memory, attention and decision processes</td> </tr> <tr> <td>4. Beliefs about capabilities</td> <td>11. Environmental context and resources</td> </tr> <tr> <td>5. Optimism</td> <td>12. Social influences</td> </tr> <tr> <td>6. Beliefs about consequences</td> <td>13. Emotion</td> </tr> <tr> <td>7. Reinforcement</td> <td>14. Behavioural regulation</td> </tr> </table>		1. Knowledge	8. Intentions	2. Skills	9. Goals	3. Social/professional role and identity	10. Memory, attention and decision processes	4. Beliefs about capabilities	11. Environmental context and resources	5. Optimism	12. Social influences	6. Beliefs about consequences	13. Emotion	7. Reinforcement	14. Behavioural regulation
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7. Reinforcement	14. Behavioural regulation															
<b>Application</b>	<ul style="list-style-type: none"> <li>• Determinant framework.</li> <li>• Most commonly used to identify barriers and facilitators to behaviour change in implementation efforts.</li> <li>• Can be used as a planning tool pre-implementation or as an evaluation tool.</li> <li>• Useful for informing the design of implementation strategies to facilitate behaviour change.</li> </ul>															
<b>Strengths &amp; weaknesses</b>	<p><i>Strengths</i></p> <ul style="list-style-type: none"> <li>• Shown to be a useful and flexible framework for healthcare implementation studies (e.g., Phillips et al., 2015).</li> <li>• Unlike other behaviour change theories, the TDF includes social and environmental factors, not just individual factors.</li> <li>• Can be adapted for use across settings.</li> </ul>	<p><i>Weaknesses</i></p> <ul style="list-style-type: none"> <li>• Has many constructs <ul style="list-style-type: none"> <li>○ Can be difficult to decide whether and at what level to apply constructs.</li> <li>○ Can be time-consuming and resource intensive to employ comprehensively.</li> </ul> </li> <li>• Can be difficult to use if unfamiliar with psychological constructs (Phillips et al., 2015).</li> </ul>														
<b>How it is used</b>	<ul style="list-style-type: none"> <li>• Identify and specify which behaviour(s) need to be changed to increase uptake of evidence into practice.</li> <li>• Select a study design to use the TDF.</li> <li>• Develop data collection instruments (e.g., survey, interview guide) that covers all relevant TDF domains.</li> <li>• Code data into the TDF domains.</li> <li>• Document findings related to each domain.</li> </ul>															
<b>Resources</b>	<ul style="list-style-type: none"> <li>• A step-by-step guide to using the TDF: <a href="#">A guide to using the Theoretical Domains Framework of behaviour change to investigate implementation problems:</a></li> <li>• Slides and videos from a TDF workshop: <a href="#">Workshop Exploring the Theoretical Domains Framework in Behaviour Change Research</a></li> <li>• Cane, O'Connor &amp; Michie, 2012; Michie et al, 2005; Phillips et al, 2015</li> </ul>															

## Diffusion of Innovation Theory

Prevalence <sup>1</sup>	5.4%	
Description	<p>Developed by Rogers (2003), the Diffusion of Innovation Theory explains how innovations (such as an idea, behaviour or product) diffuse (or spread) among individuals in a social system. Mass media, interpersonal channels, and opinion leaders play an important role in the diffusion process.</p> <p>Some individuals are more prone to adopt an innovation than others in a social system, and these individuals have different characteristics. The distribution of different types of adopters follow a bell-shaped curve:</p>  <p style="text-align: right; font-size: small;">Source: Everett Rogers (Diffusion of Innovations model)</p> <p>Image from <a href="http://sphweb.bumc.bu.edu/otlt/MPHModules/SB/BehavioralChangeTheories/BehavioralChangeTheories4.html">http://sphweb.bumc.bu.edu/otlt/MPHModules/SB/BehavioralChangeTheories/BehavioralChangeTheories4.html</a></p> <p>The five adopter categories and five attributes that influence how quickly an innovation is adopted are provided in Appendix D.</p>	
Application	<ul style="list-style-type: none"> <li>• Classic theory.</li> <li>• Commonly used to speed up the adoption of interventions that aim to change behaviour within a given social setting (e.g., a specific hospital department).</li> <li>• Can be used to assess whether or not an intervention should be adopted.</li> </ul>	
Strengths & weaknesses	<p><i>Strengths</i></p> <ul style="list-style-type: none"> <li>• Considered one of the most influential theories in knowledge utilization (Nilsen, 2015).</li> <li>• Attempts to provide an explanation of how change occurs (is a theory)</li> <li>• Considered to be a community-level theory, focused on how change occurs within large populations such as communities or institutions.</li> </ul>	<p><i>Weaknesses</i></p> <ul style="list-style-type: none"> <li>• Too simplified - does not account for contextual, cultural and economic differences that influence how an innovation is adopted into society.</li> <li>• More focused on adoption of behaviours, rather than prevention of behaviours.</li> </ul>
How it is used	<ul style="list-style-type: none"> <li>• Through the lens of the theory, develop an approach to examine participants' acceptance and use of an innovation, and what features influenced their decision to adopt it (e.g., surveys, interviews).</li> <li>• Calculate distribution of adopter categories.</li> <li>• Develop strategies that can be differentially applied to target adopters.</li> </ul>	
Resources	<ul style="list-style-type: none"> <li>• A case study of how the theory can be used: <a href="#">Using diffusion of innovation theory to understand the factors impacting patient acceptance and use of consumer e-health innovations: A case study in a primary care clinic</a></li> <li>• Rogers, 2003</li> </ul>	

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## Exploration, Preparation, Implementation, Sustainment (EPIS)

<b>Prevalence<sup>1</sup></b>	4.9%	
<b>Description</b>	<p>EPIS consists of four phases that describe and guide the implementation process, and examines outer (system) and inner (organizational) contextual factors that can support or hinder implementation (see Appendix E).</p> <p>The four phases are:</p> <ul style="list-style-type: none"> <li>▪ <b>Exploration:</b> Implementers evaluate the needs and potential fit of the evidence-based practice (EBP) within the system/organization. A decision to adopt the EBP is made.</li> <li>▪ <b>Preparation:</b> Potential barriers and facilitators to implementation are identified, and a plan is developed to integrate the EBP within the system/organization. Internal and external support is gained, and training/coaching to facilitate use of the EBP begins.</li> <li>▪ <b>Implementation:</b> The EBP is implemented. Ongoing monitoring is incorporated to ensure the EBP is being delivered with fidelity.</li> <li>▪ <b>Sustainment:</b> The EBP is embedded in the organization, with ongoing EBP quality assurance processes.</li> </ul>	
<b>Application</b>	<ul style="list-style-type: none"> <li>• Fits under multiple categories – can be used to understand the process of translating research into practice, to understand what influences implementation outcomes, to understand aspects of implementation and to evaluate implementation.</li> <li>• Useful as a planning tool to map implementation strategies across a study to EPIS phases.</li> </ul>	
<b>Strengths &amp; weaknesses</b>	<p><i>Strengths</i></p> <ul style="list-style-type: none"> <li>• Can be used for several purposes, reducing the need to use multiple theories, models or frameworks (Moullin et al., 2019).</li> <li>• Accounts for factors at the individual, organizational and systems level.</li> </ul>	<p><i>Weaknesses</i></p> <ul style="list-style-type: none"> <li>• Very complex – multi-level and four phases to implementation.</li> </ul>
<b>How it is used</b>	<ul style="list-style-type: none"> <li>• Identify use and purpose of EPIS</li> <li>• Identify phase to employ EPIS</li> <li>• Select measures to assess EPIS constructs at each phase: <ul style="list-style-type: none"> <li>○ Outer context</li> <li>○ Inner context</li> <li>○ Innovation factors</li> <li>○ Bridging factors</li> </ul> </li> <li>• Measures and tools can be found <a href="#">here</a></li> </ul>	
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Resources for using EPIS including measures and tools (e.g., worksheets, guides): <a href="#">EPIS Framework</a></li> <li>• Moullin et al, 2019</li> </ul>	

## Proctor's Implementation Outcomes Framework

<b>Prevalence<sup>1</sup></b>	4.9%	
<b>Description</b>	<p>Proctor's Framework was developed to evaluate successful implementation. The framework consists of eight implementation outcomes that are used as indicators of implementation success (see Appendix F):</p> <ol style="list-style-type: none"> <li>1. Acceptability</li> <li>2. Adoption</li> <li>3. Appropriateness</li> <li>4. Feasibility</li> <li>5. Fidelity</li> <li>6. Implementation cost</li> <li>7. Penetration (integration of practice within a specific setting)</li> <li>8. Sustainability</li> </ol>	
<b>Application</b>	<ul style="list-style-type: none"> <li>• Evaluation framework.</li> <li>• Most commonly used to evaluate successful implementation in a setting.</li> </ul>	
<b>Strengths &amp; weaknesses</b>	<p><i>Strengths</i></p> <ul style="list-style-type: none"> <li>• Differentiates between <i>implementation outcomes</i>, <i>service outcomes</i>, and <i>client outcomes</i>, of which implementation outcomes is most important in implementation science (Proctor et al., 2011).</li> </ul>	<p><i>Weaknesses</i></p> <ul style="list-style-type: none"> <li>• May be challenging to develop valid indicators to measure implementation success.</li> </ul>
<b>How it is used</b>	<ul style="list-style-type: none"> <li>• Decide which outcomes to assess.</li> <li>• Depending on the current stage of implementation, your choice of outcomes may differ. For example, acceptability may be more important early on in the process, while sustainability may be more important later in the process.</li> <li>• Determine measures for each outcome (e.g., using satisfaction as a measure of Acceptability)</li> <li>• A toolkit to help you identify measures is available <a href="#">here</a>.</li> </ul>	
<b>Resources</b>	<ul style="list-style-type: none"> <li>• A toolkit that reviews outcomes commonly used in implementation research, offers guidance on choosing which implementation outcomes to include in your study, and provides resources: <a href="#">Implementation Outcomes Toolkit</a></li> <li>• Proctor et al., 2011</li> </ul>	

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## Appendix A: CFIR

Domains and constructs of the Consolidated Framework for Implementation Research (CFIR).

Construct		Description
<b>Domain I: Intervention Characteristics</b>		
<b>A</b>	Intervention Source	Perception of key stakeholders about whether the intervention is externally or internally developed.
<b>B</b>	Evidence Strength and Quality	Stakeholders' perceptions of the quality and validity of evidence supporting the belief that the intervention will have desired outcomes.
<b>C</b>	Relative Advantage	Stakeholders' perception of the advantage of implementing the intervention versus an alternative solution.
<b>D</b>	Adaptability	The degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs.
<b>E</b>	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.
<b>F</b>	Complexity	Perceived difficulty of the intervention, reflected by duration, scope, radicalness, disruptiveness, centrality, and intricacy and number of steps required to implement.
<b>G</b>	Design Quality and Packaging	Perceived excellence in how the intervention is bundled, presented, and assembled.
<b>H</b>	Cost	Costs of the intervention and costs associated with implementing the intervention including investment, supply, and opportunity costs.
<b>Domain II: Outer Setting</b>		
<b>A</b>	Patient Needs and 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>B</b>	Cosmopolitanism	The degree to which an organization is networked with other external organizations.
<b>C</b>	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.
<b>D</b>	External Policies and 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.
<b>Domain III: Inner Setting</b>		
<b>A</b>	Structural Characteristics	The social architecture, age, maturity, and size of an organization.
<b>B</b>	Networks and Communications	The nature and quality of webs of social networks and the nature and quality of formal and informal communications within an organization.
<b>C</b>	Culture	Norms, values, and basic assumptions of a given organization.



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<b>D</b>	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.
<b>D1</b>	Tension for Change	The degree to which stakeholders perceive the current situation as intolerable or needing change.
<b>D2</b>	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.
<b>D3</b>	Relative Priority	Individuals' shared perception of the importance of the implementation within the organization.
<b>D4</b>	Organizational Incentives and 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.
<b>D5</b>	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.
<b>D6</b>	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.
<b>E</b>	Readiness for Implementation	Tangible and immediate indicators of organizational commitment to its decision to implement an intervention.
<b>E1</b>	Leadership Engagement	Commitment, involvement, and accountability of leaders and managers with the implementation.
<b>E2</b>	Available Resources	The level of resources dedicated for implementation and on-going operations, including money, training, education, physical space, and time.
<b>E3</b>	Access to Knowledge and Information	Ease of access to digestible information and knowledge about the intervention and how to incorporate it into work tasks.
<b>Domain IV: Characteristics of Individuals</b>		
<b>A</b>	Knowledge and 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>B</b>	Self-efficacy	Individual belief in their own capabilities to execute courses of action to achieve implementation goals.
<b>C</b>	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.
<b>D</b>	Individual Identification with Organization	A broad construct related to how individuals perceive the organization, and their relationship and degree of commitment with that organization.
<b>E</b>	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.

<b>Domain V: Process</b>		
<b>A</b>	Planning	The degree to which a scheme or method of behaviour and tasks for implementing an intervention are developed in advance, and the quality of those schemes or methods.
<b>B</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.
<b>B1</b>	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.
<b>B2</b>	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.
<b>B3</b>	Champions	Individuals who dedicate themselves to supporting, marketing, and 'driving through' an implementation, overcoming indifference or resistance that the intervention may provoke in an organization.
<b>B4</b>	External Change Agents	Individuals who are affiliated with an outside entity who formally influence or facilitate intervention decisions in a desirable direction.
<b>C</b>	Executing	Carrying out or accomplishing the implementation according to plan.
<b>D</b>	Reflecting and Evaluating	Quantitative and qualitative feedback about the progress and quality of implementation accompanied with regular personal and team debriefing about progress and experience.

## Appendix B: RE-AIM

Dimensions of the RE-AIM Framework (Glasgow et al., 1999).

Dimension	Definition	Level
<b>Reach</b>	Proportion of the target population that participated in the intervention	Individual
<b>Effectiveness or Efficacy</b>	Success rate if implemented as in guidelines; defined as positive outcomes minus negative outcomes	Individual
<b>Adoption</b>	Proportion of settings, practices, and plans that will adopt this intervention	Organization
<b>Implementation</b>	Extent to which the intervention is implemented as intended in the real world	Individual and organization
<b>Maintenance</b>	Extent to which a program is sustained over time	Individual and organization

## Appendix C: TDF

Domains and constructs of the refined Theoretical Domains Framework (Cane et al., 2012).

Domain	Constructs
1. <b>Knowledge:</b> An awareness of the existence of something.	Knowledge (including knowledge of condition/scientific rationale) Procedural knowledge Knowledge of task environment
2. <b>Skills:</b> An ability or proficiency acquired through practice.	Skills Skills development Competence Ability Interpersonal skills Practice Skill assessment
3. <b>Social/Professional Role and Identity:</b> A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting	Professional identity Professional role Social identity Identity Professional boundaries Professional confidence Group identity Leadership Organisational commitment
4. <b>Beliefs about Capabilities:</b> Acceptance of the truth, reality, or validity about an ability, talent, or facility that a person can put to constructive use	Self-confidence Perceived competence Self-efficacy Perceived behavioural control Beliefs Self-esteem Empowerment Professional confidence
5. <b>Optimism:</b> The confidence that things will happen for the best or that desired goals will be attained	Optimism Pessimism Unrealistic optimism Identity

<p><b>6. Beliefs about Consequences:</b> Acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation</p>	<p>Beliefs Outcome expectancies Characteristics of outcome expectancies Anticipated regret Consequents</p>
<p><b>7. Reinforcement:</b> Increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus</p>	<p>Rewards (proximal/distal, valued/not valued, probable/improbable) Incentives Punishment Consequents Reinforcement Contingencies Sanctions</p>
<p><b>8. Intentions:</b> A conscious decision to perform a behaviour or a resolve to act in a certain way</p>	<p>Stability of intentions Stages of change model Transtheoretical model and stages of change</p>
<p><b>9. Goals:</b> Mental representations of outcomes or end states that an individual wants to achieve</p>	<p>Goals (distal/proximal) Goal priority Goal/target setting Goals (autonomous/controlled) Action planning Implementation intention</p>
<p><b>10. Memory, Attention and Decision Processes:</b> The ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives</p>	<p>Memory Attention Attention control Decision making Cognitive overload/tiredness</p>
<p><b>11. Environmental Context and Resources:</b> Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour</p>	<p>Environmental stressors Resources/material resources Organisational culture/climate Salient events/critical incidents Person x environment interaction Barriers and facilitators</p>

<p><b>12. Social Influences:</b> Those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviours</p>	<p>Social pressure Social norms Group conformity Social comparisons Group norms Social support Power Intergroup conflict Alienation Group identity Modelling</p>
<p><b>13. Emotion:</b> A complex reaction pattern, involving experiential, behavioural, and physiological elements, by which the individual attempts to deal with a personally significant matter or event</p>	<p>Fear Anxiety Affect Stress Depression Positive/negative affect Burn-out</p>
<p><b>14. Behavioural Regulation:</b> Anything aimed at managing or changing objectively observed or measured actions</p>	<p>Self-monitoring Breaking habit Action planning</p>

## Appendix D: Diffusion of Innovation

Rogers' Diffusion of Innovation theory

The five adopter categories are:

- **Innovators:** These individuals are eager to adopt an innovation. They are venturesome, risk takers and the first to try an innovation. Little needs to be done to appeal to this population.
- **Early adopters:** These individuals are opinion leaders or stakeholders in a social system. They are visionaries and comfortable adopting an innovation.
- **Early majority:** These individuals are more comfortable with change than the average member of a social system. They are pragmatists and will deliberate some time before they will adopt an innovation.
- **Late majority:** These individuals are more conservative and will only adopt an innovation after it has been adopted by the majority.
- **Laggards:** These individuals are the last to adopt an innovation. They are traditionalists and skeptical of change.

Rogers further identifies five attributes that influence how quickly an innovation is adopted.

- **Compatibility:** The degree to which an innovation is consistent with the current values, beliefs, and ways of doing things.
- **Relative advantage:** The degree to which an innovation is seen as more advantageous than the current one.
- **Complexity:** The degree to which an innovation is easy to understand and/or use.
- **Observability:** The degree to which an innovation provides tangible results.
- **Trialability:** The degree to which an innovation can be tested before a decision is made to adopt.

# Appendix E: EPIS

The four phases of the EPIS Framework and the factors (outer and inner contextual factors, bridging factors, and innovation factors) associated with successful implementation.

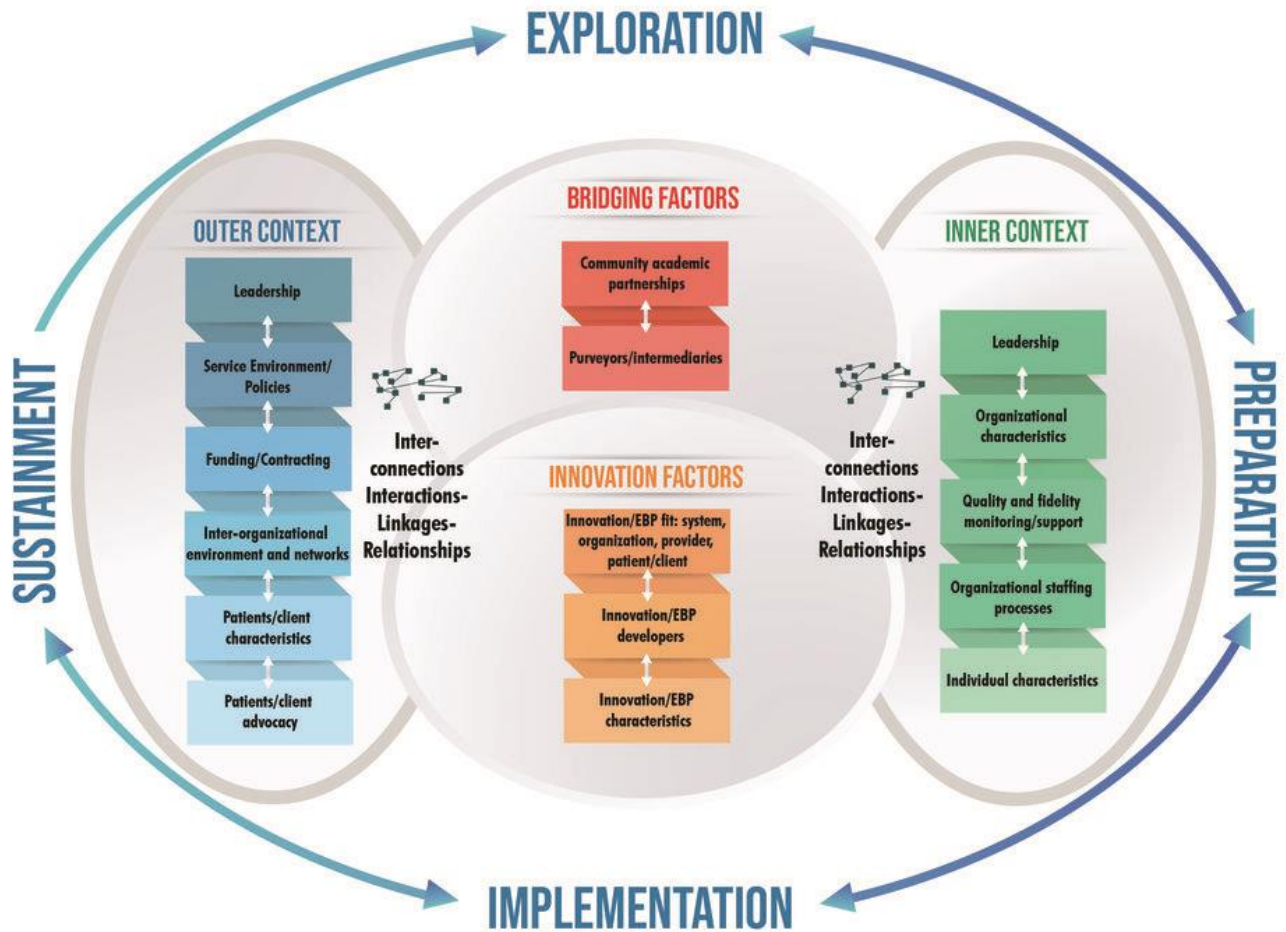


Image from <http://episframework.com/>



## Appendix F: Implementation outcomes

Proctor et al. (2011) distinguished between implementation outcomes, service outcomes, and client outcomes. Eight implementation outcomes were conceptualized as indicators of implementation success.

