

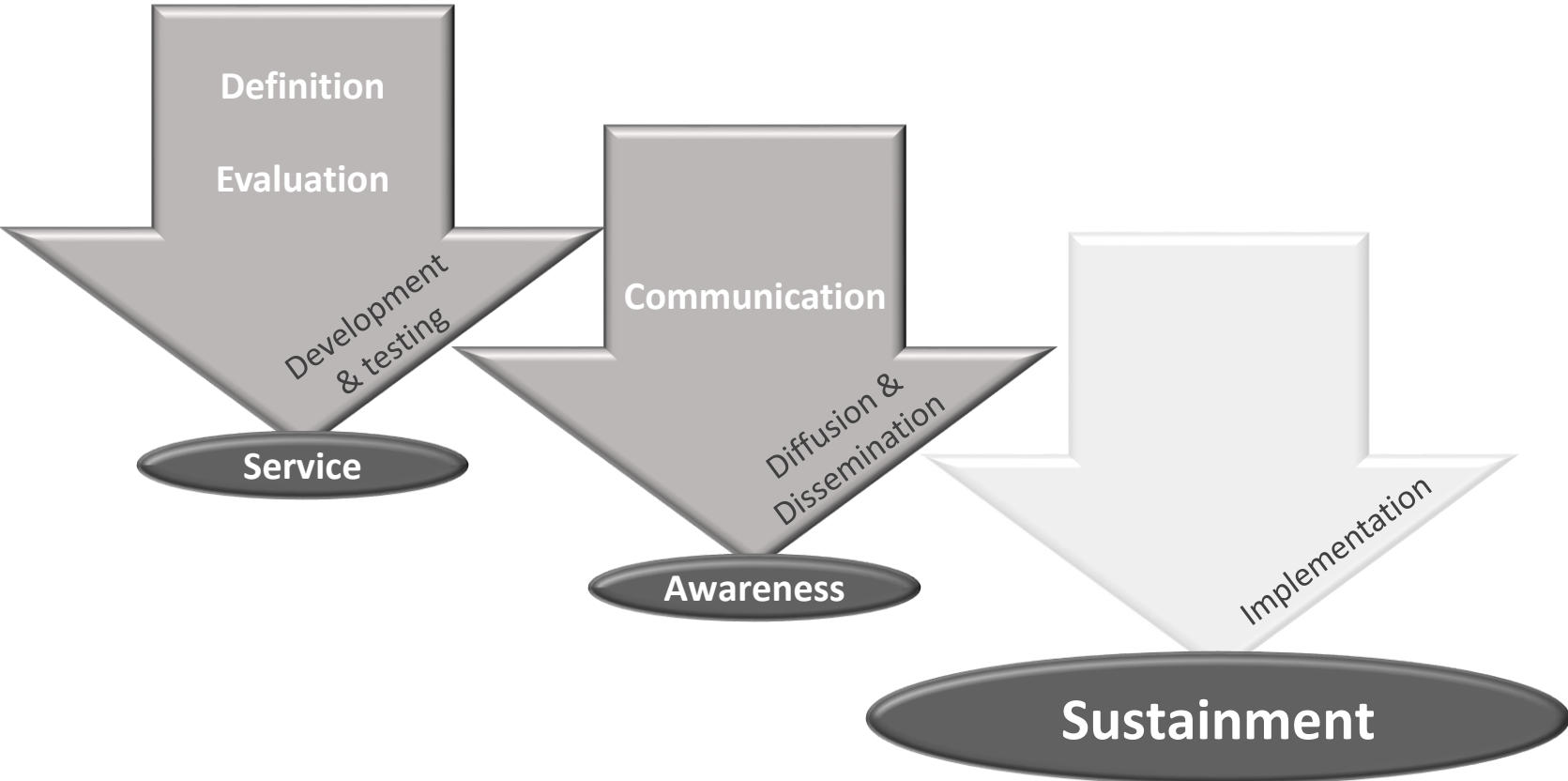
# **INTRODUCTION TO IMPLEMENTATION SCIENCE**

**Joanna C Moullin**

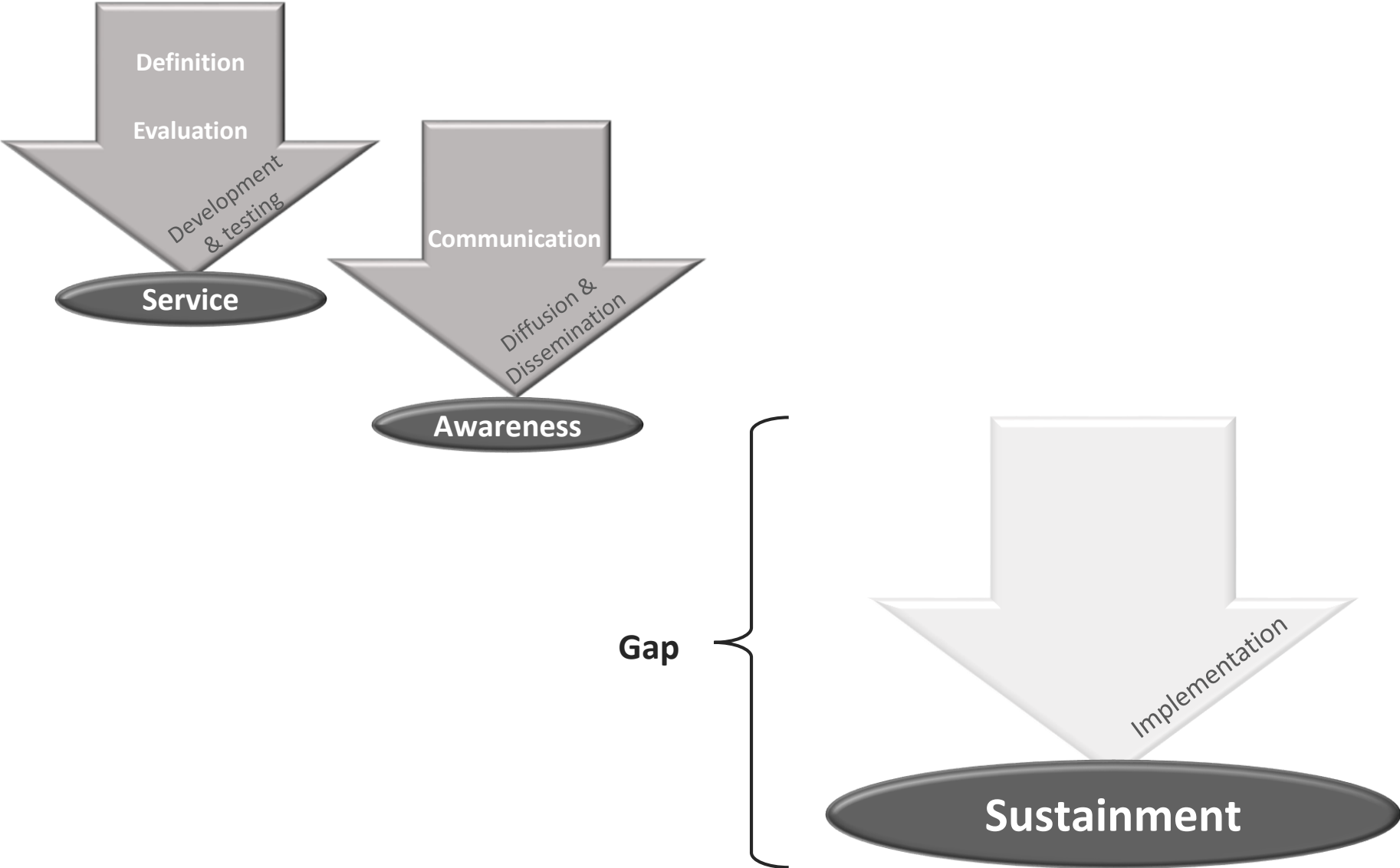
# SUMMARY

- Background and terminology
- Core implementation concepts
- Implementation research & design
- Application
- Resources

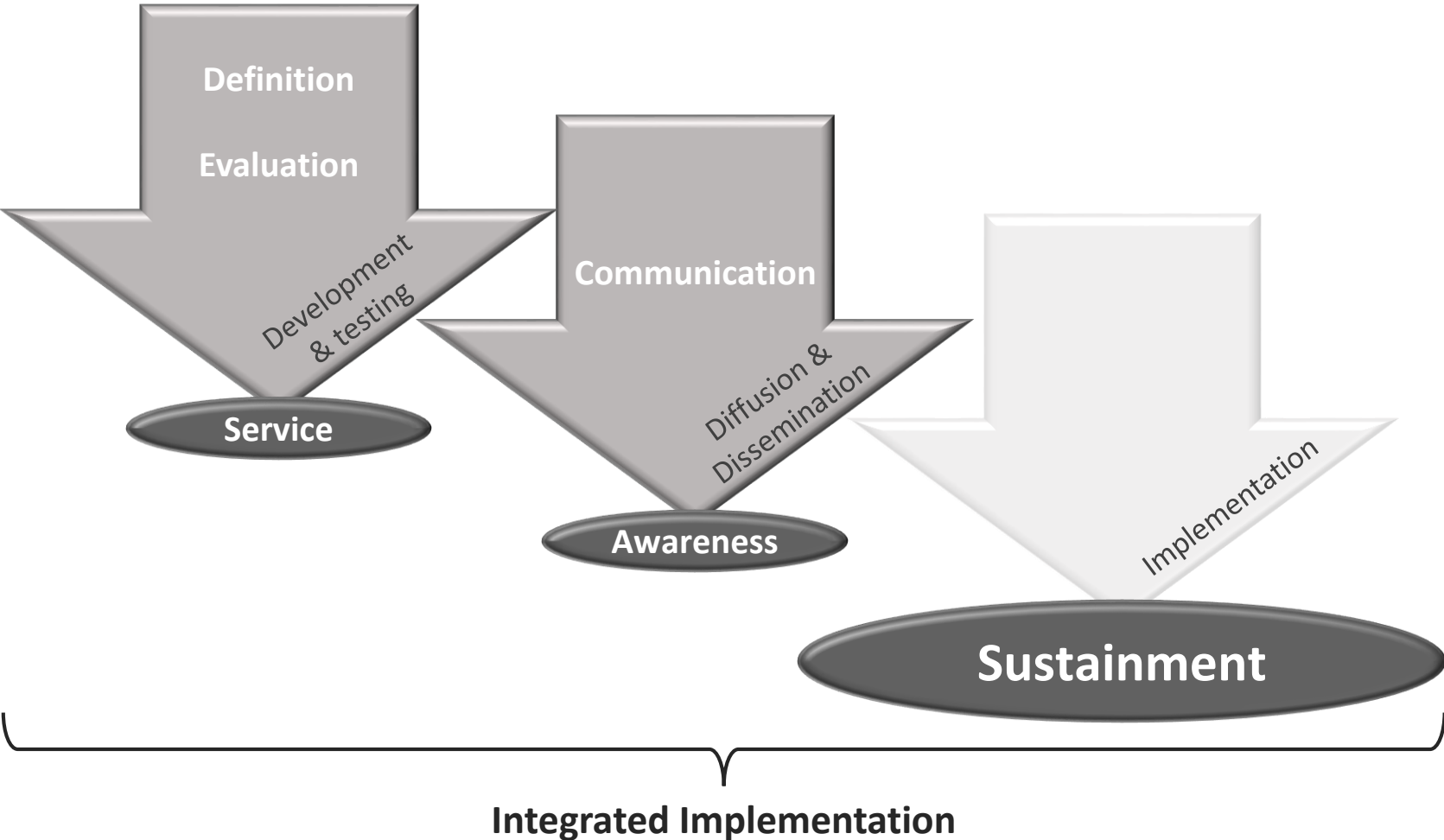
# EVIDENCE PATHWAY



# EVIDENCE PATHWAY



# EVIDENCE PATHWAY



# RE-AIM FRAMEWORK

**A**DOPTION

*“Individuals cannot  
benefit from  
interventions they do  
not experience”*

**R**EACH

*Schroeder, J.A (2011)*

**I**MPLEMENTATION (FIDELITY)

**E**FFECTIVENESS

**M**AINTENANCE (sustainability)

# IMPORTANCE OF IMPLEMENTATION

		Implementation	
		Effective	Not effective
Innovation	Effective	Actual benefits	Inconsistent; unsustainable; poor outcomes
	Not effective	Poor outcomes	Poor outcomes; possibly harmful

# IMPLEMENTATION SCIENCE

The study of how evidence-based or evidence-informed practices and innovations are adopted, replicated, and scaled up in diverse practice settings

**Diffusion:** Letting it happen

- Focus on the innovation and its adoption

**Dissemination:** Helping it happen

- Focus on practitioner and contextual readiness to understand and use the innovation

**Implementation (Application):** Making it happen

- Focus on how to use the innovation as intended to achieve outcomes

*Knowledge Translation (transfer, exchange)*



# FOUNDATION OF IMPLEMENTATION SCIENCE

**Disciplines:** Sociology, Political Science, Business, Communications

**Theories:** Cognitive, Behavioural, Organisational

Complexity theory and systems thinking to cross ecological models

Similarities and draws from:

- Improvement science (Continuous quality improvement)
- Quality improvement including Six Sigma, Lean thinking etc.
- Change management, organisational change
- Quality of care

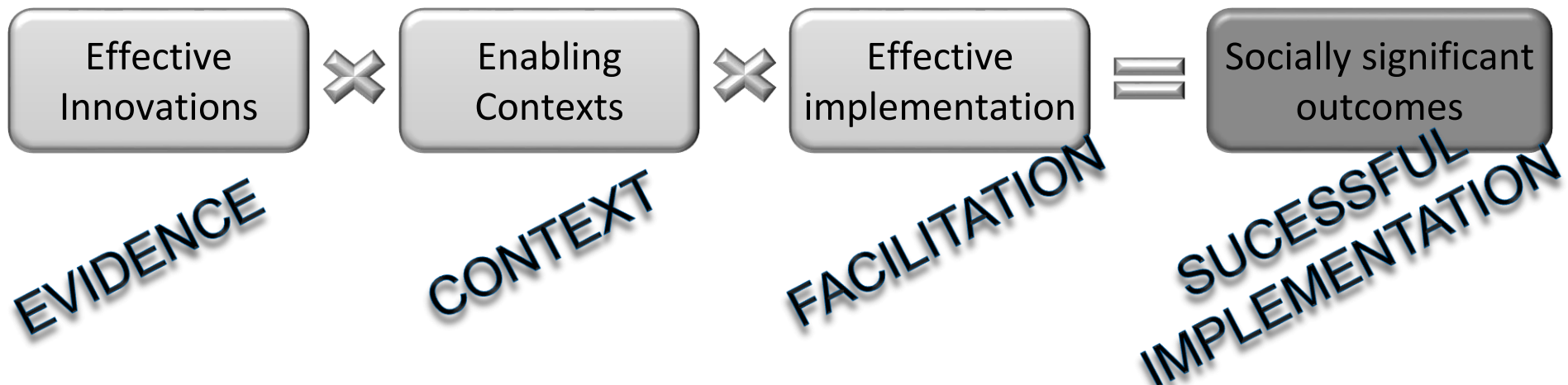
# IMPLEMENTATION SCIENCE

	Health services research	Implementation research
Aim	Understand processes and factors associated with health	Understand processes and factors associated with implementation
Intervention	Clinical intervention INNOVATION / SERVICE	Implementation intervention STRATEGY / PROGRAM
Determinants	Health behaviour determinants DETERMINANTS / BEHAVIOURS	Determinants of practice FACTORS / INFLUENCES
End-user	Patient	Implementer

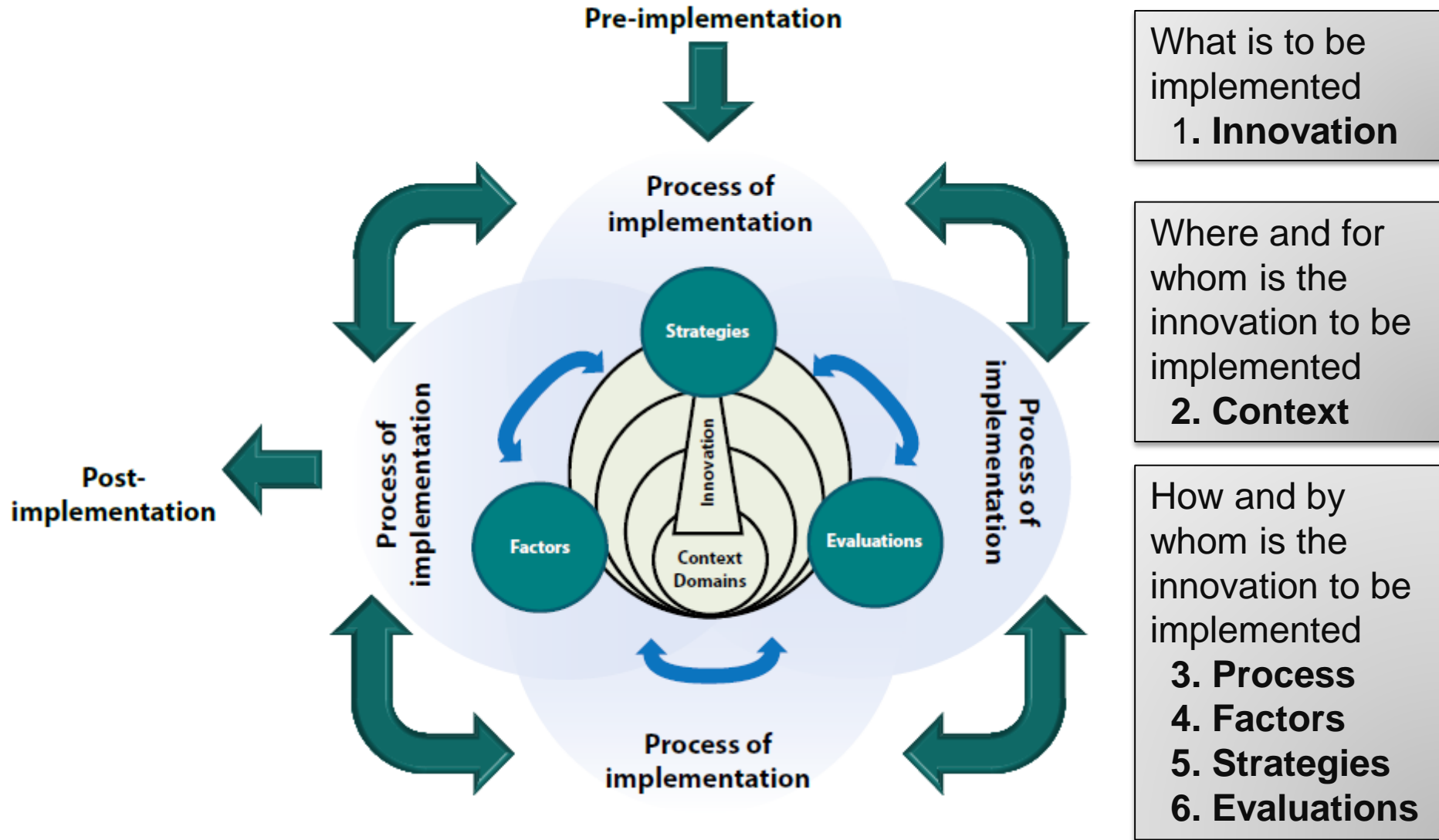
# IMPLEMENTATION CONCEPTS

In basic terms implementation success is impacted by

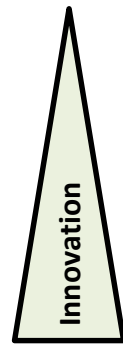
- ✓ What is to be implemented  
(the innovation)
- ✓ Where and for whom is the innovation to be implemented  
(the context)
- ✓ How and by whom is the innovation to be implemented  
(the implementation program)



# GENERIC IMPLEMENTATION FRAMEWORK



# WHAT IS TO BE IMPLEMENTED?



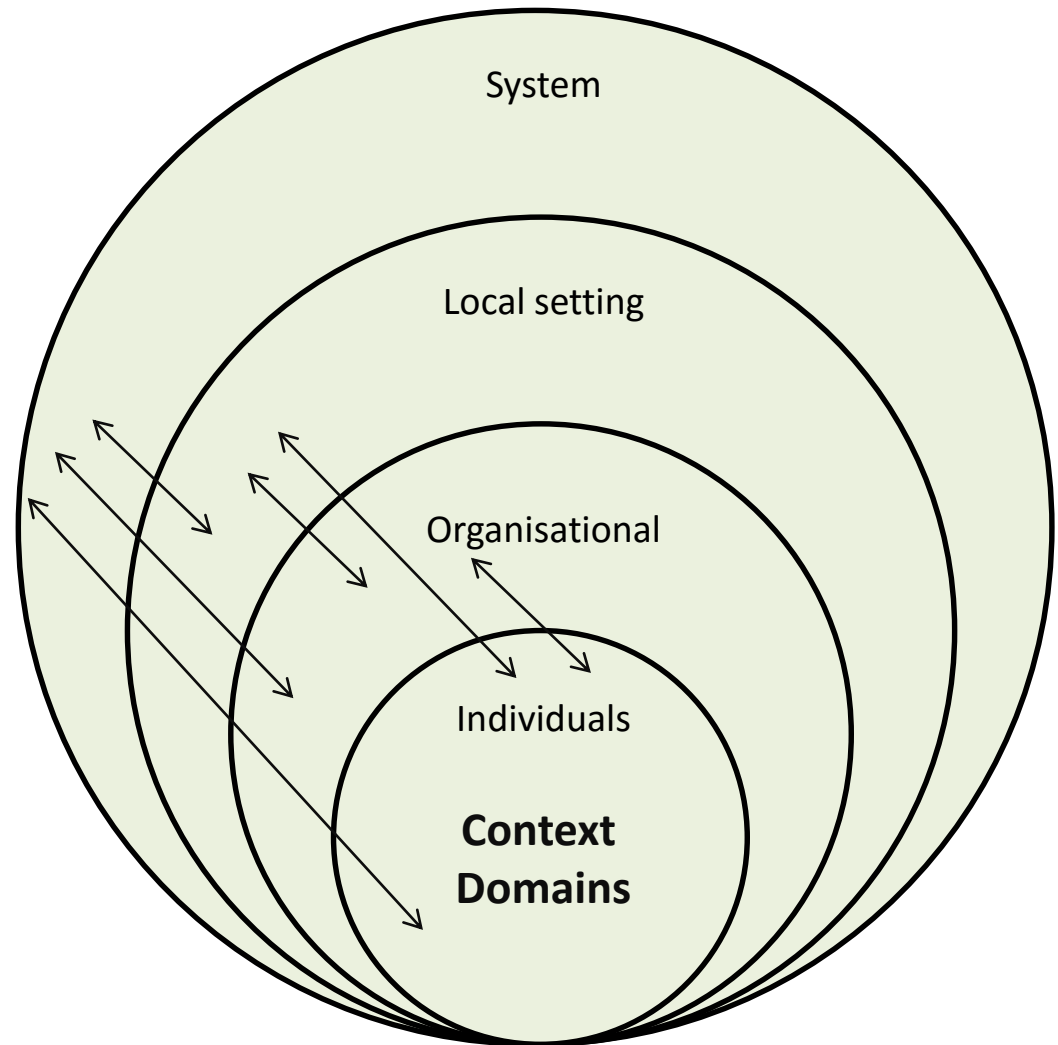
Any Innovation (or any research evidence)

- Novel behaviour or group of behaviours (practice)
- New technology
- Clinical practice guideline or decision aid
- Program or service

<b>Fidelity</b>	<b>Adaptation</b>
<p>Service is delivered as it was designed and intended.</p> <p>➤ Only the service as it was studied is known to be effective</p>	<p>Service is adjusted, individualised for the context.</p> <p>➤ The service may not be or unable to be used if not adapted</p>

# WHERE AND FOR WHOM IS THE INNOVATION TO BE IMPLEMENTED

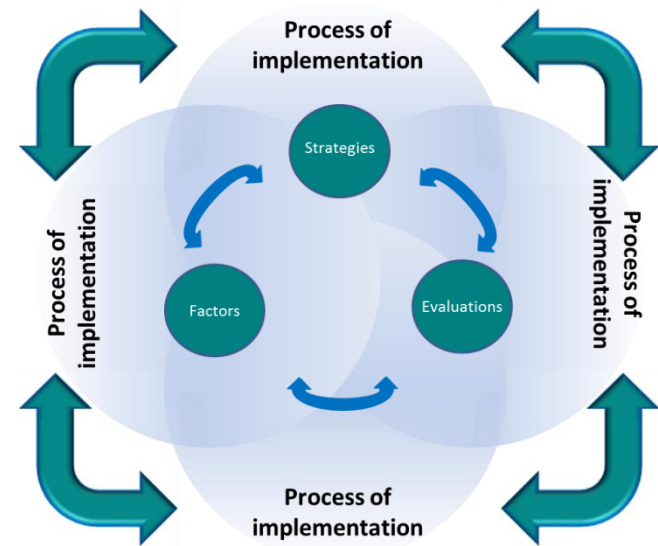
**Ecological model of context**



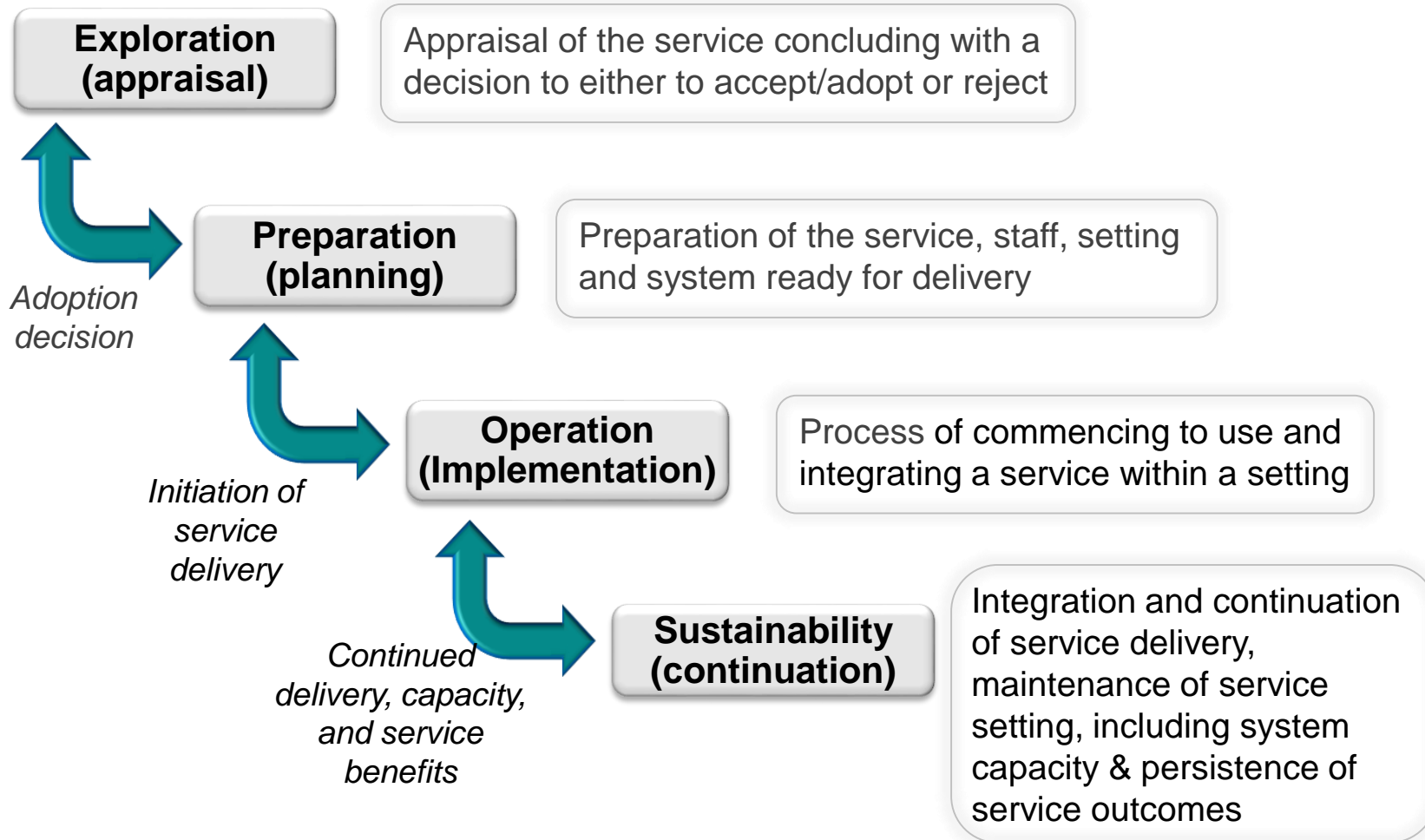
# HOW AND BY WHOM IS THE INNOVATION TO BE IMPLEMENTED

## Crux of Implementation Science

- Implementation is not a single event but a **process**
- Is non-linear however is often divided into stages
- Stages may further be broken down into steps
- At each stage implementation is affected by **factors, strategies and evaluations**

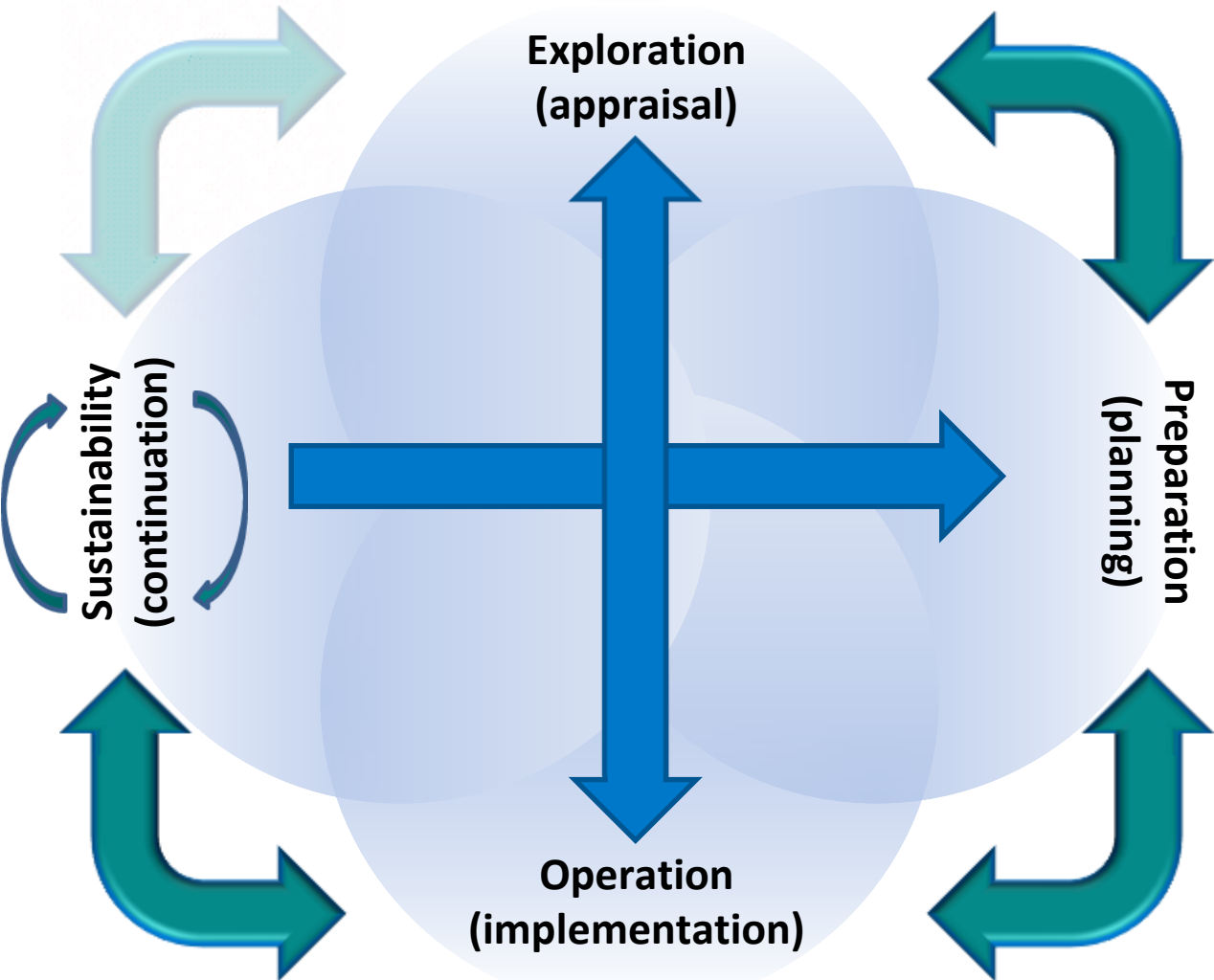


# STAGES

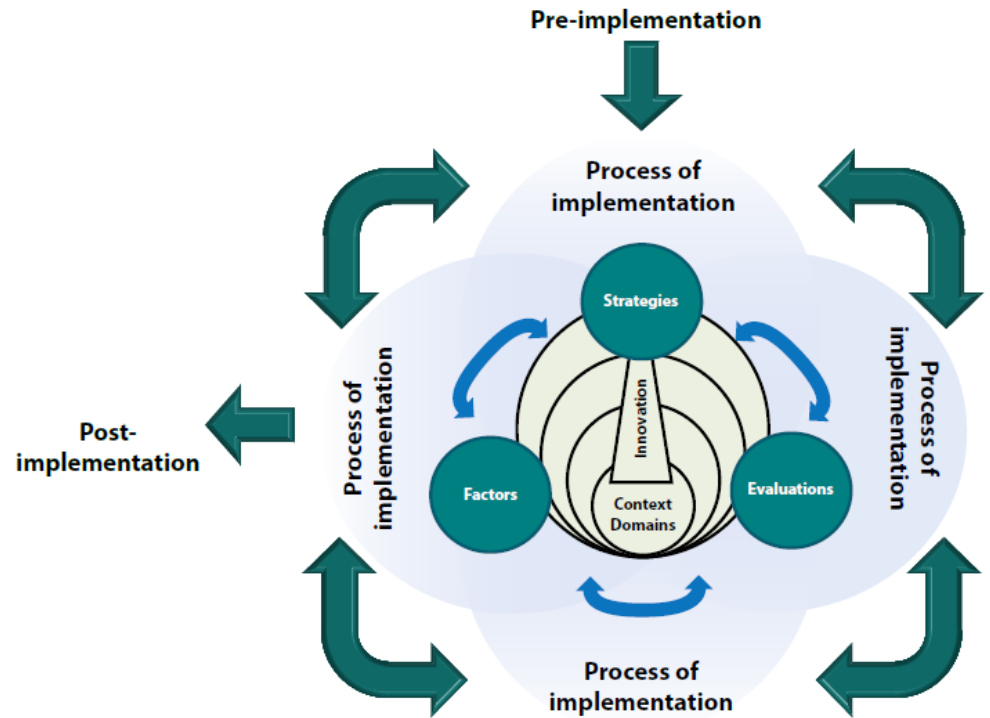




# STAGES



# FACTORS



- Also termed barriers or facilitators
- Effect the implementation process either positively or negatively
- Assess factors at every stage of the implementation process for every domain
- Detailed checklists and questionnaires for determining and classifying factors exist



# SYSTEM

(Political, economical, professional)

Intraprofessional network

Interprofessional relations

## LOCAL SETTING

(Community, patients, local healthcare professionals)

Guidelines & tools

Remuneration

Legislation & policy

Knowledge

Demographics

## ORGANISATION(S)

Acceptance & awareness

Relationships

Needs & Resources

Communication

Leadership

Workflow

Network

Team work

Characteristics

## INDIVIDUALS

Readiness

Beliefs

Climate

Organisation identification

Structure

Culture

Acceptance & awareness

Motivation

Capacity

## INNOVATION

Knowledge & skills

Self-efficacy

Evidence

Relative advantage

Trialability

Complexity

Cost

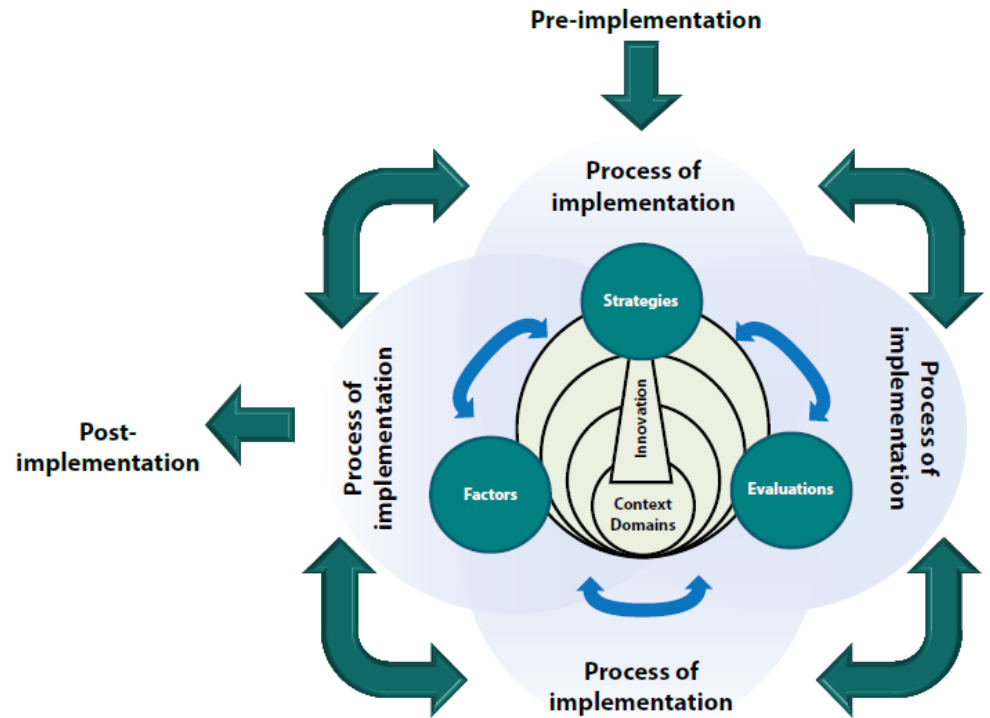
Beliefs

Fit

Adaptability

Observability

# STRATEGIES



- Strategies are targeted towards building competency/ability, a supportive pharmacy environment and leadership for ongoing implementation and sustainability
- Tailored interventions are determined to utilise the facilitators and overcome barriers during for each step of the process

# WHAT WE KNOW DOES NOT WORK

Single implementation strategies are not enough:

- Laws and policy changes
- Funding
- Access to or communication (diffusion and dissemination) of information
- Training alone
- Implementation without changing support roles and functions

A combination of multiple strategies across all levels affecting the implementation process are needed.

# THEN WHAT DOES WORK?

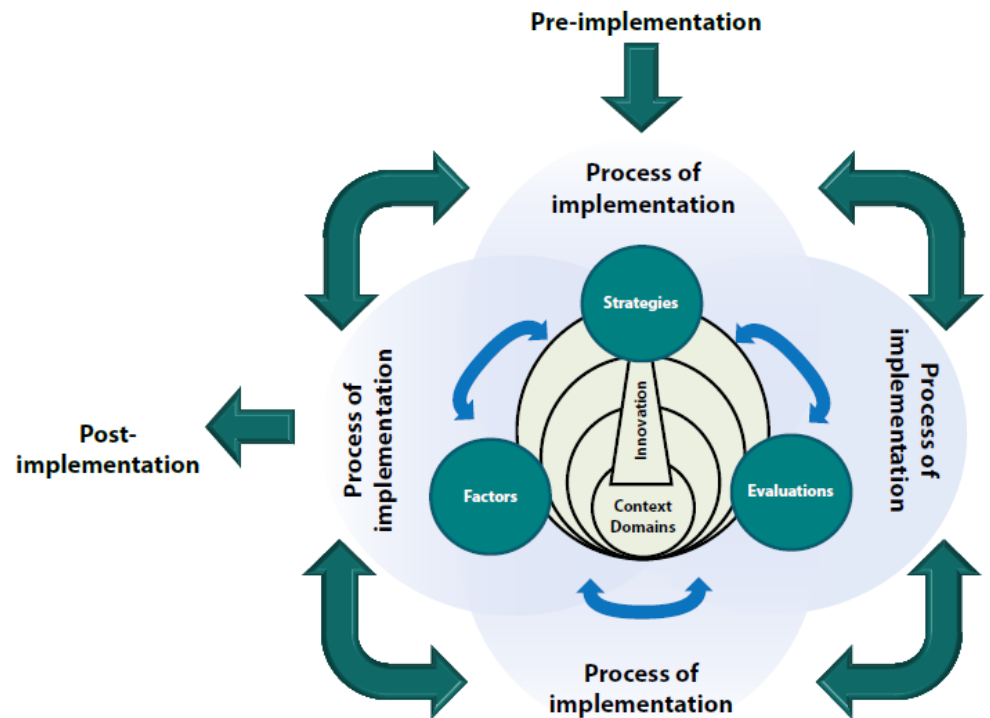
Must consider context and influencing factors unique to each implementation effort and each setting

Multi-component individualised implementation interventions

Moving towards evidence-based strategies

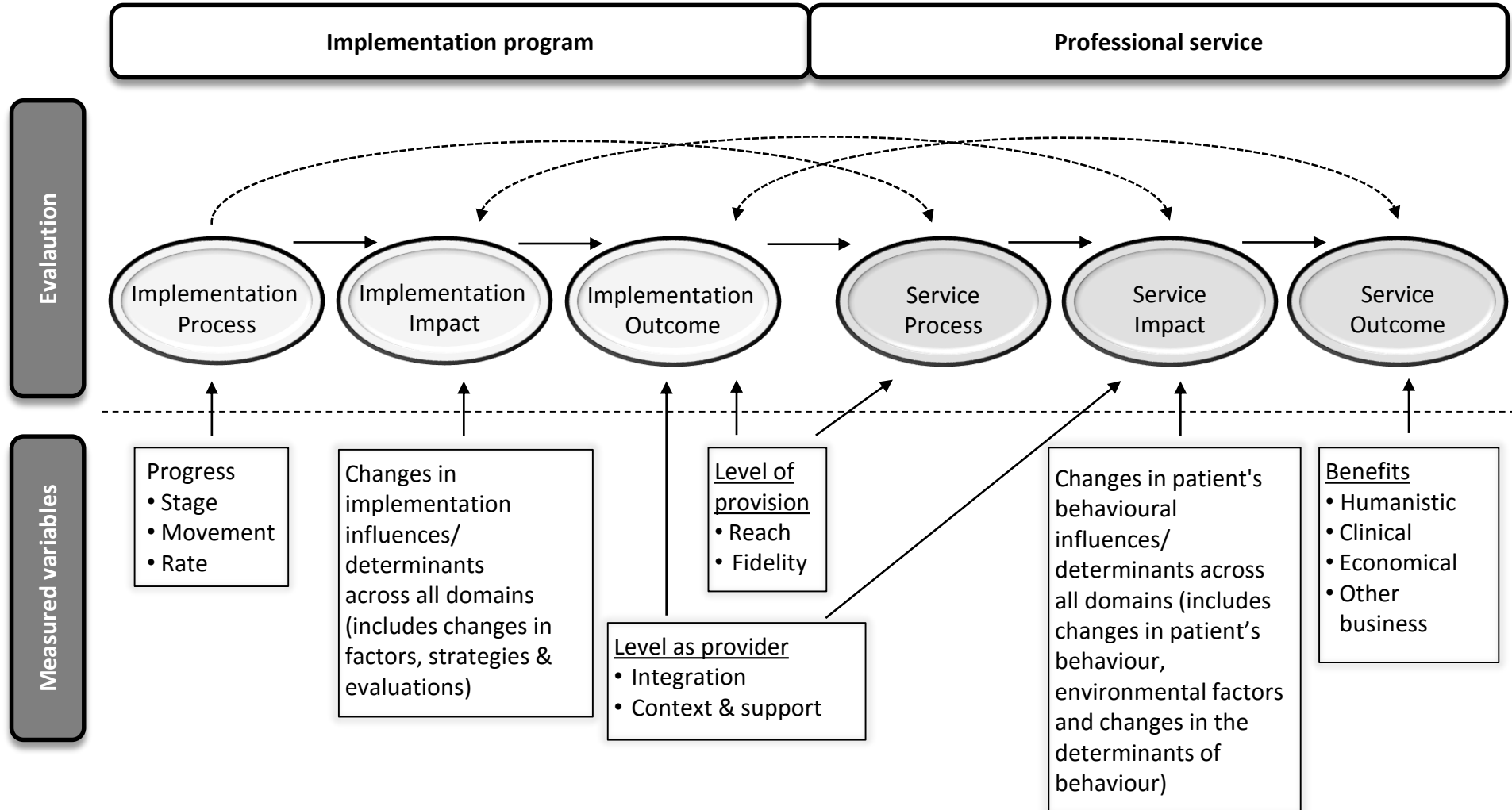
- Training
- Coaching/facilitation
  - Supervision “More practice, less preach” (role-play over modelling )  
(Bearman *et al.* & The Research Network on Youth Mental Health 2013)
- Feedback-systems
- Reminders
- Leadership (as well as champions and opinion leaders)

# EVALUATIONS



- Indicators of the movement through the stages
- Formative process evaluation
- Measures of the factors and change in factors (e.g. skills and return on investment)
- Evaluation of the strategies and interventions (implementation program)
- Measurement of implementation and service outcomes

# EVALUATIONS





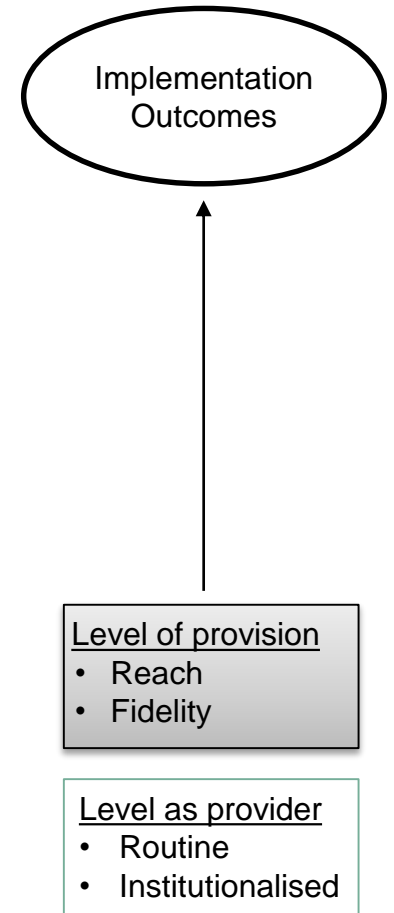
# LEVEL OF PROVISION

## - REACH -

Number of services performed and number ongoing as percent of potentially eligible participants (a) invited (b) commenced but stopped (d) declined

## - FIDELITY -

The extent to which the service is performed as originally designed. Components of fidelity include adherence, dose, quality, patient responsiveness, program differentiation, adaptation.



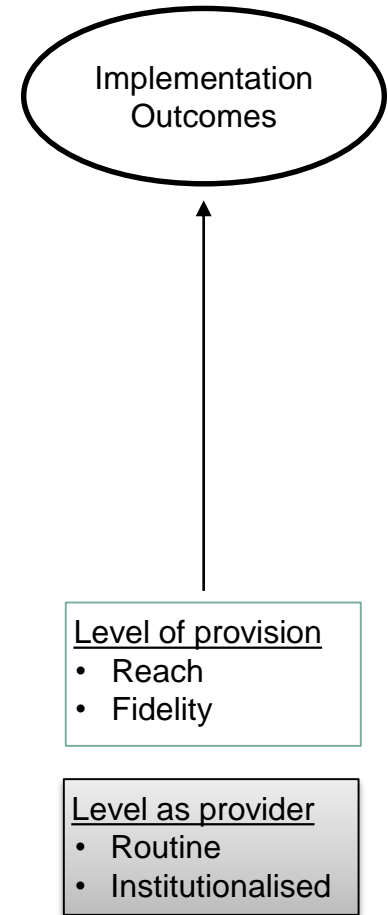
# LEVEL AS SERVICE PROVIDER

## - ROUTINISATION -

Degree the new service has become a part of everyday practice.

## - INSTITUTIONALISATION -

Support and conditions that encourage, assist and enable service delivery.



# RECAP

## **Six core concepts of implementation**

Implementation involves

- (1) an innovation,
- (2) a multi-level context,
- (3) a complex multi-stage process,

Influenced by a range of

- (4) factors
- (5) strategies
- (6) and evaluations (formative and summative).

# IMPLEMENTATION RESEARCH

**“Seeks to understand the processes and factors that are associated with successful integration of evidence-based interventions within a particular setting”**

(Rabin 2008, p. 119)

Grant proposals request

- Dissemination and knowledge translation strategies
- Evaluations of real-world impact
- Maybe in the future an implementation plan?

**“State of the science (what researchers collectively know) and the state of the art (what practitioners collectively do) co-existed more or less autonomously, each realm of activity having left effect on the other”**

(Dearing & Kee 2012, p. 55.)

# IMPLEMENTATION RESEARCH

Scientific investigations that support the movement of innovations into routine care resulting in recommendations for faster take-up of improvements and spread by different people. Includes addressing the level to which health interventions, such as professional services, can fit within real-world public health and clinical service systems.

## STUDY DESIGN

- Mixed Methods
- Hybrid design
- Stepped-Wedge
- Comparative-effectiveness
- Pragmatic
- Participatory Action Research
- Intervention mapping
- Analyses: Realist evaluation, social network analysis

# STEPPED-WEDGE

## Cross-over design

<u>1</u>	<u>2</u>
X	O
X	O
X	O
O	X
O	X
O	X

## Stepped-Wedge

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
O	X	X	X	X
O	O	X	X	X
O	O	X	X	X
O	O	O	X	X
O	O	O	O	X

# HYBRID DESIGNS

**Clinical effectiveness  
Research**

**Implementation  
Research**

## **Hybrid Type I**

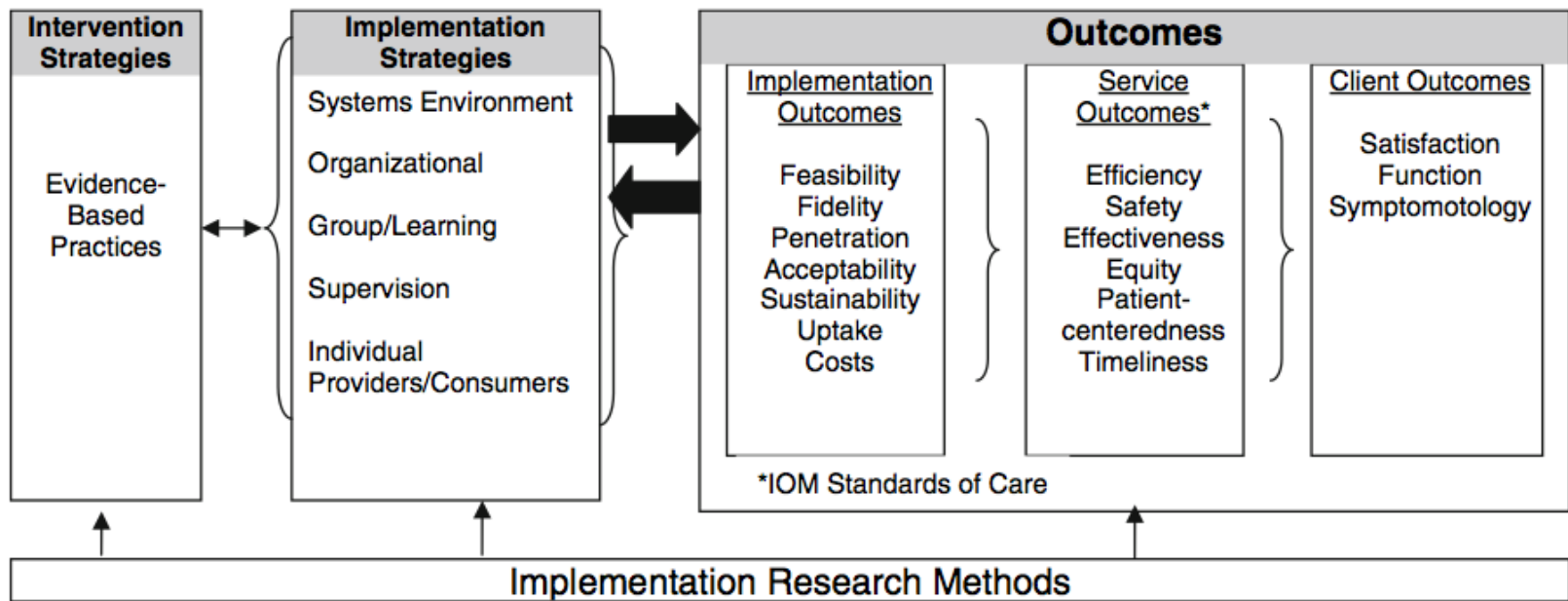
- Test clinical or service outcomes
- Observe/Gather information on implementation strategy/program

## **Hybrid Type II**

- Equally test or study implementation strategy/program AND clinical or service outcomes

## **Hybrid Type III**

- Test implementation strategy/program
- Observe/Gather information on clinical or service outcomes



**Fig. 1** Conceptual model of implementation research

Implementation outcomes: The effects of deliberate and purposive actions to implement new treatments, practices, and services



# RESEARCH QUESTIONS

- When is an organization ready to implement a new innovation?
- What supports and systems are needed for effective implementation?
- What organizational and contextual factors support or impede effective implementation?
- What dosage and quality of the service must be provided to produce meaningful impacts?
- What strategies are effective for engaging participants in services?
- How can innovations be adapted for replication in diverse practice settings and with different populations?

# RESEARCH VARIABLES FOR HYPOTHESES

Variable 1	Variable 2
<b>'x' implementation strategy</b>	<p>"y" implementation process indicator (rate &amp;/or attainment of implementation stages)</p> <p>'y' implementation impact indicator (factor)</p> <p>"y" implementation outcome (Fidelity, reach or integration &amp;/or support)</p>
<p><b>"x" implementation impact indicator</b></p> <p>e.g. x = Implementation climate (or constituents of Culture/Climate/Perception etc.)</p> <p>e.g. Perception (awareness/acceptance/ understanding) of the service (by pharmacy staff, members of the local community &amp;/or other health care professionals)</p> <p>e.g. Organisational Capacity/Readiness</p>	<p>"y" implementation outcomes (Fidelity or Reach or Integration &amp;/or support)</p> <p>or "y" service outcomes</p>
<p><b>"x" implementation outcome</b></p> <p>e.g. x = fidelity or reach</p>	<ul style="list-style-type: none"> <li>- Rate of movement and attainment of implementation stages</li> <li>- Patient outcomes</li> <li>- Economic, clinical and humanistic outcomes</li> </ul>

# REPORTING: STRATEGY

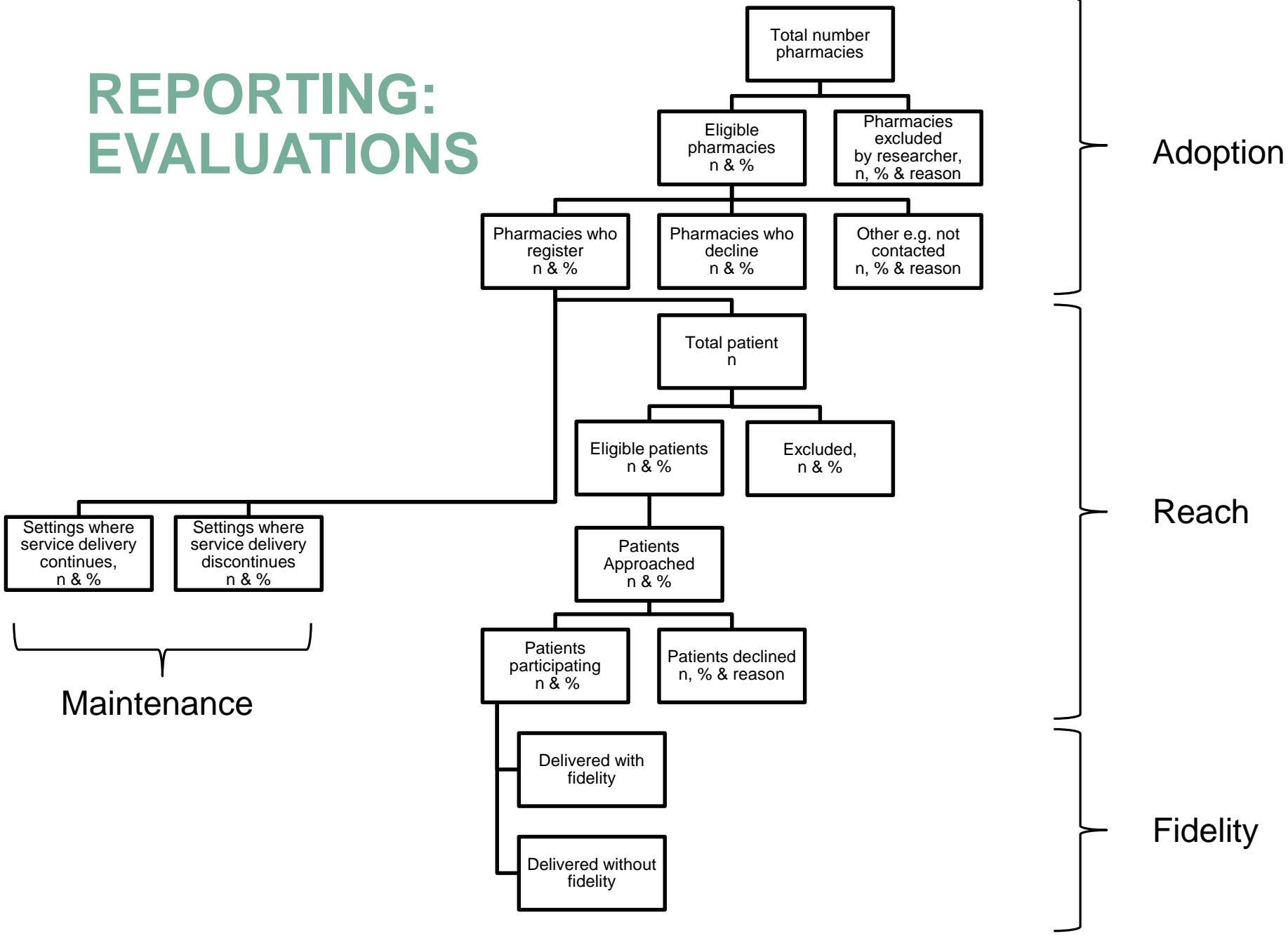
1. **Name**
2. **Define**
3. **Specify**

Seven components specification for measurement and reproducibility

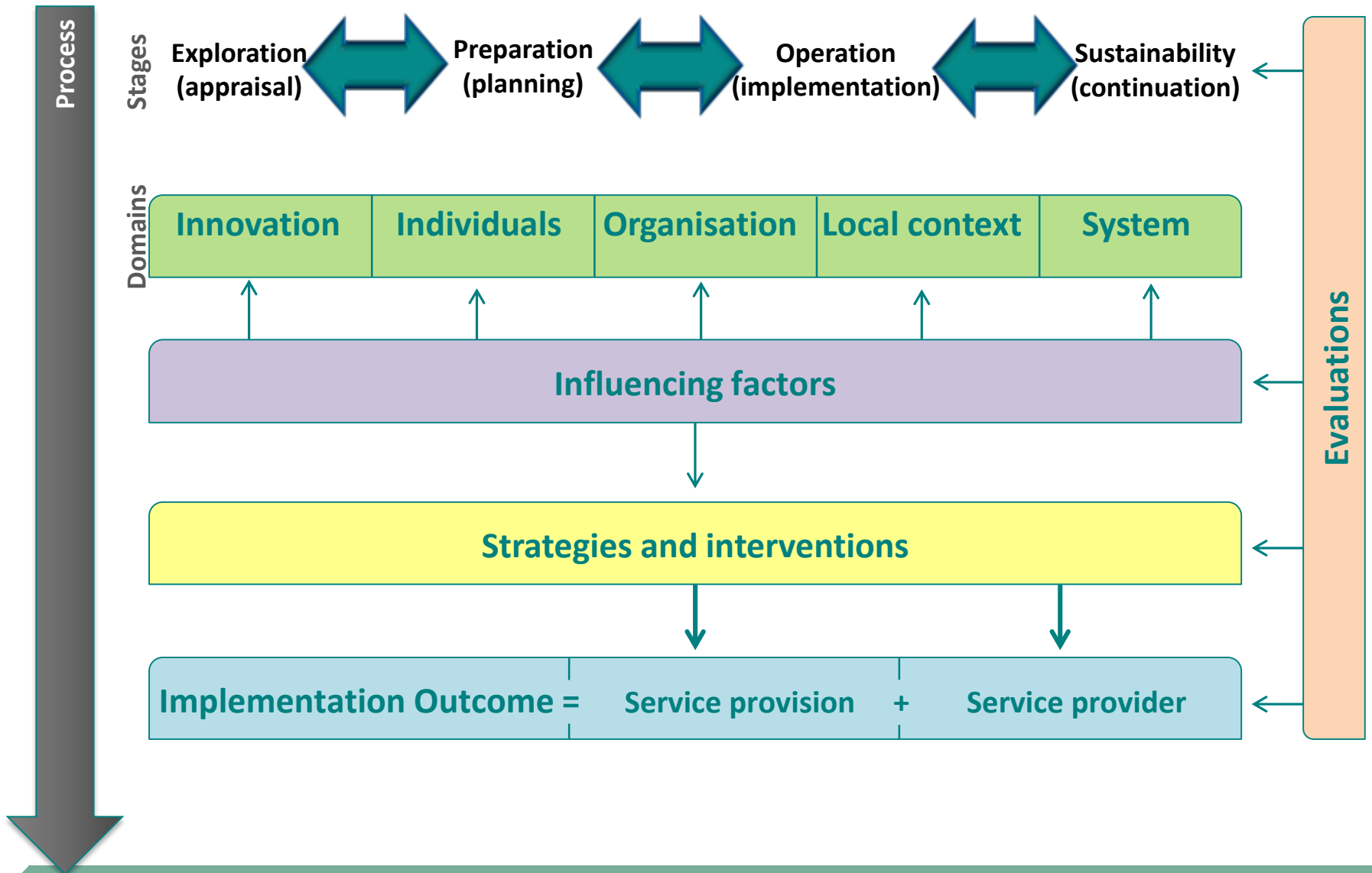
- I. Actor
- II. Action
- III. Action targets
- IV. Temporality (when)
- V. Dose (duration, how often)
- VI. Outcomes
- VII. Theory/justification

Accurate reporting allows for efficiency, cost and effectiveness testing

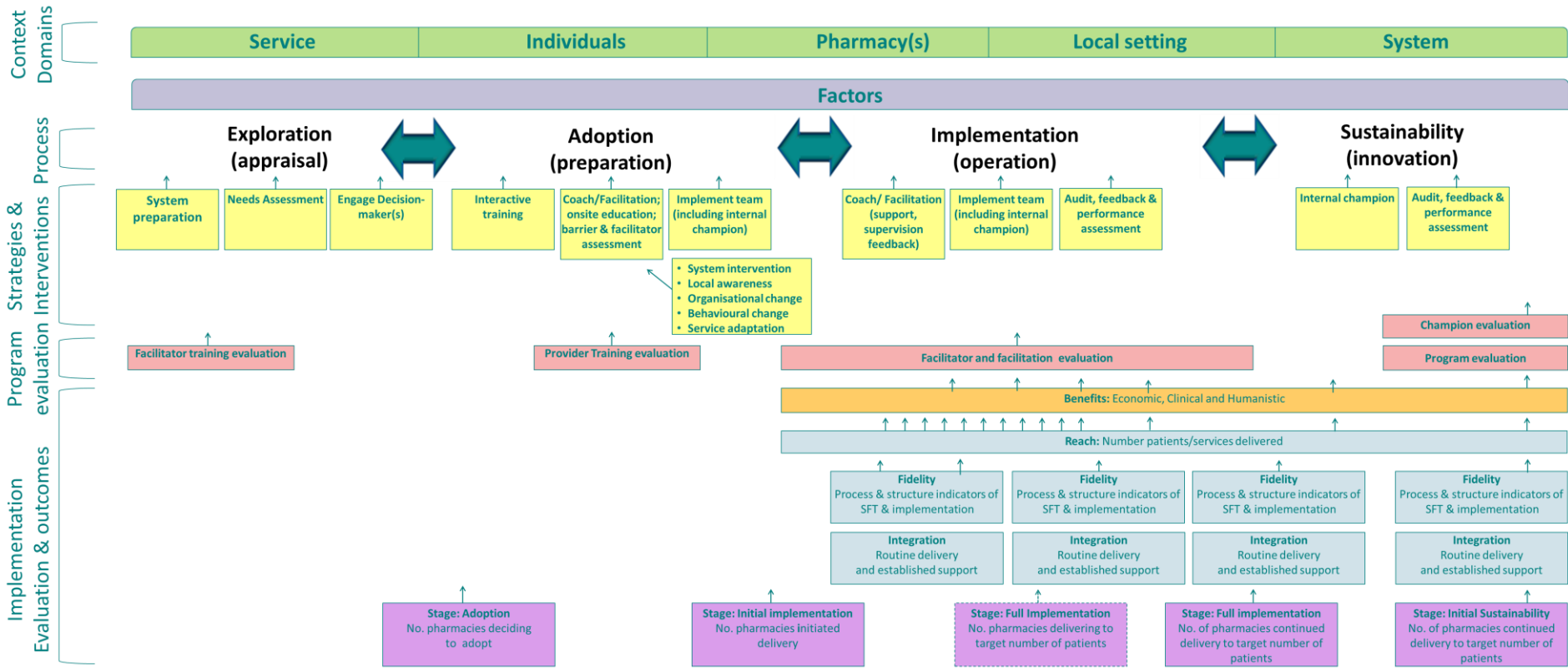
# REPORTING: EVALUATIONS



# SUMMARY



# CASE STUDY



# TAKE HOME MESSAGES

- Implementation is a process not a point or single event
- Involves multiple stakeholders across different contextual levels
- Implementation affects service process, impact and outcomes

# RESOURCES

- **World Health Organization (WHO)**  
The Alliance for Health Policy and Systems Research (AHPSR)  
<http://www.who.int/alliance-hpsr/projects/implementationresearch/en/>  
The Implementation Research Platform (IRP)  
<http://www.implementationresearchplatform.org/>
- **Cochrane Effective Practice and Organisation of Care Group (EPOC)**  
<http://epoc.cochrane.org/>
- **Society for Implementation Research Collaboration (SIRC)**  
<http://www.societyforimplementationresearchcollaboration.org/>
- **National Implementation Research Network (NIRN)**  
<http://nirn.fpg.unc.edu/>
- **Knowledge Translation Canada**  
<http://ktclearinghouse.ca/ktcanada>
- **Centre for Effective Services (CES) Dublin**  
<http://www.effectiveservices.org/implementation/implementation>



# RESOURCES: initiatives, groups, networks

- Global Implementation Initiative <http://globalimplementation.org/>
- European Implementation Collaborative <http://www.implementation.eu/>
- UK Implementation Network (UK-IN) <http://uk-in.org.uk/index.html>
- Australasian Implementation Network <http://implementationaustralasia.net/>
- Implementation Network <http://www.implementationnetwork.com>
- Colorado Implementation Collaborative <http://www.coloradoimplementation.com/>
- Nordic Implementation Interest Group  
<http://www.imh.liu.se/implementering-och-larande/nordic-implementation?l=en>
- Triangle Implementation Research Group
- California Implementation Symposium
- Global Conference on Research Integration and Implementation
- NCI: National Cancer Institute Implementation Science  
<http://cancercontrol.cancer.gov/IS/index.html>
- Canadian Institute of Health Research: <http://www.cihr-irsc.gc.ca/e/39033.html>

# RESOURCES: theories, models, frameworks, tools, guides

- Normalisation Process Theory (NPT) <http://www.normalizationprocess.org/>
- GEM D& I <https://www.gem-beta.org/public/wsoverview.aspx?cat=8&aid=0&wid=11>
- Society for Implementation Research Collaboration (SIRC) Instrument Project <http://www.societyforimplementationresearchcollaboration.org/sirc-projects/sirc-instrument-project/>
- Consolidated Framework for Implementation Research <http://cfirguide.org/>
- Knowledge Translation (KT)Wiki <http://whatiskt.wikispaces.com/>
- Behaviour Change Wheel (Theoretical Domains Framework) <http://www.behaviourchangewheel.com/>
- Quality Enhancement Research Initiative (QUERI) <http://www.queri.research.va.gov/>
- Ontario Centre of Excellence for Child and Youth Mental Health <http://www.excellenceforchildand youth.ca/resource-hub/learning-modules>
- Institute for Healthcare Improvement: Break Through Series <http://www.ihl.org/resources/Pages/IHIWhitePapers/TheBreakthroughSeriesIHICollaborativeModelforAchievingBreakthroughImprovement.aspx>
- National Collaborating Centre for Methods and Tools <http://www.nccmt.ca/>
- Centre for Health Education Dissemination and Implementation Research <http://www.research-practice.org/default.aspx>

# RESOURCES – SOCIAL MEDIA

- **Twitter**

@ImplementSci

@diportal\_unc

@CIHR\_IRSC

@effectiveserv

@ColmpC

@gic

@researchimpact

@ImpTriangle

@ImplementCollab

@KTCanada

@ImpScience

@UK\_ImpNet

@implement\_australia

@GlobalImplement

@PharmImp

#impsci

#implementationscience

#implementation

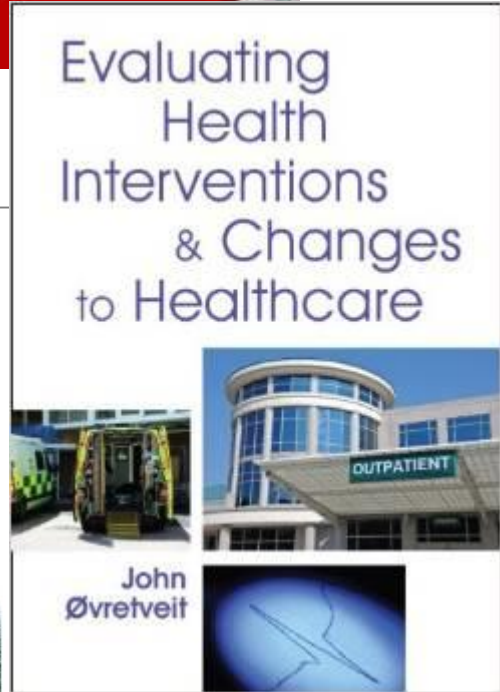
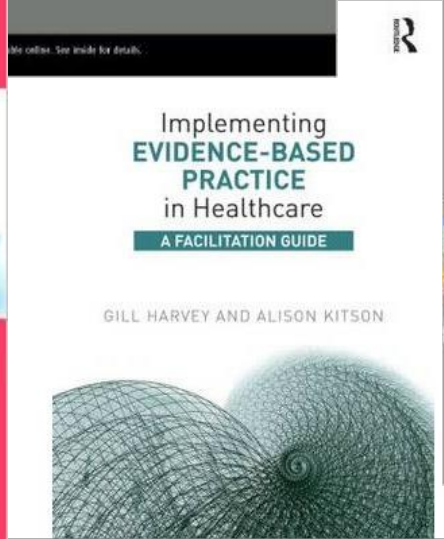
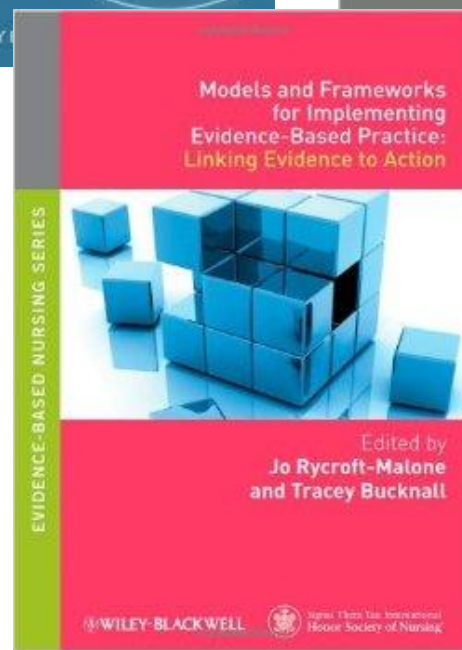
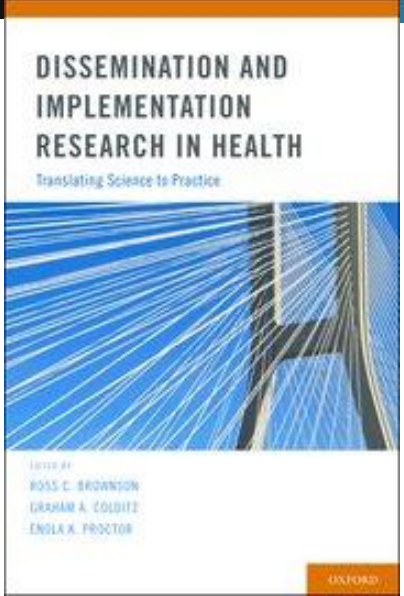
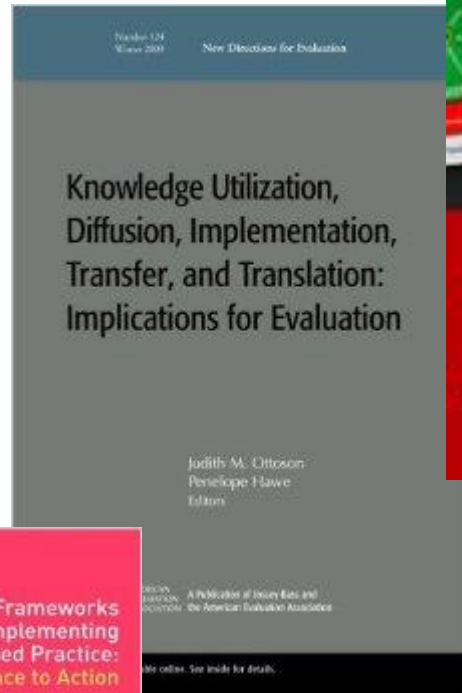
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- **Youtube** “implementation science”

- **LinkedIn**

# RESOURCES - BOOKS



**THANK YOU**

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