



# IMPACT

SWISS IMPLEMENTATION SCIENCE NETWORK

# Using artificial intelligence to facilitate the implementation of services in community pharmacy

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# Webinar overview

Moussa et al. *Implementation Science* (2021) 16:73  
<https://doi.org/10.1186/s13021-021-01138-8> Implementation Science

RESEARCH Open Access

**Data-driven approach for tailoring facilitation strategies to overcome implementation barriers in community pharmacy**

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**Abstract**

**Background:** Implementation research has delved into barriers to implementing change and interventions for the implementation of innovation in practice. There remains a gap, however, that fails to connect implementation barriers to the most effective implementation strategies and provide a more tailored approach during implementation. This study aimed to explore barriers for the implementation of professional services in community pharmacies and to predict the effectiveness of facilitation strategies to overcome implementation barriers using machine learning techniques.

**Methods:** Six change facilitators facilitated a 2-year change programme aimed at implementing professional services across community pharmacies in Australia. A mixed methods approach was used where barriers were identified by change facilitators during the implementation study. Change facilitators trialled and recorded tailored facilitation strategies delivered to overcome identified barriers. Barriers were coded according to implementation factors derived from the Consolidated Framework for Implementation Research and the Theoretical Domains Framework. Tailored facilitation strategies were coded into 16 facilitation categories. To predict the effectiveness of these strategies, data mining with random forest was used to provide the highest level of accuracy. A predictive resolution percentage was established for each implementation strategy in relation to the barriers that were resolved by that particular strategy.

**Results:** During the 2-year programme, 1131 barriers and facilitation strategies were recorded by change facilitators. The most frequently identified barriers were a 'lack of ability to plan for change', 'lack of internal supporters for the change', 'lack of knowledge and experience', 'lack of monitoring and feedback', 'lack of individual alignment with the change', 'undefined change objectives', 'lack of objective feedback' and 'lack of time'. The random forest algorithm used was able to provide 96.9% prediction accuracy. The strategy category with the highest predicted resolution rate across the most number of implementation barriers was to empower stakeholders to develop objectives and solve problems.

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Background

Objectives

Methods

Results

Limitations

Conclusion

Questioning time

Moussa L, Benrimoj S, Musial K, Kocbek S, Garcia-Cardenas V. Data-driven approach for tailoring facilitation strategies to overcome implementation barriers in community pharmacy. *Implement Sci.* 2021;16(1):73

# Research Team

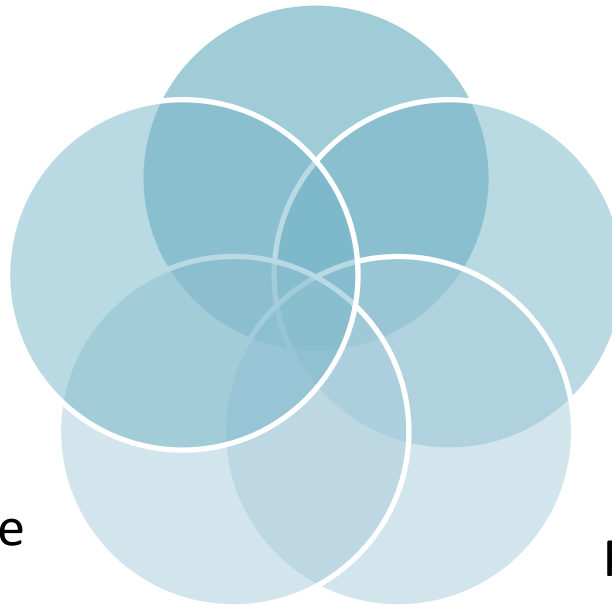
Practitioner  
pharmacists

UTS – School of  
Engineering

Practice change  
facilitators

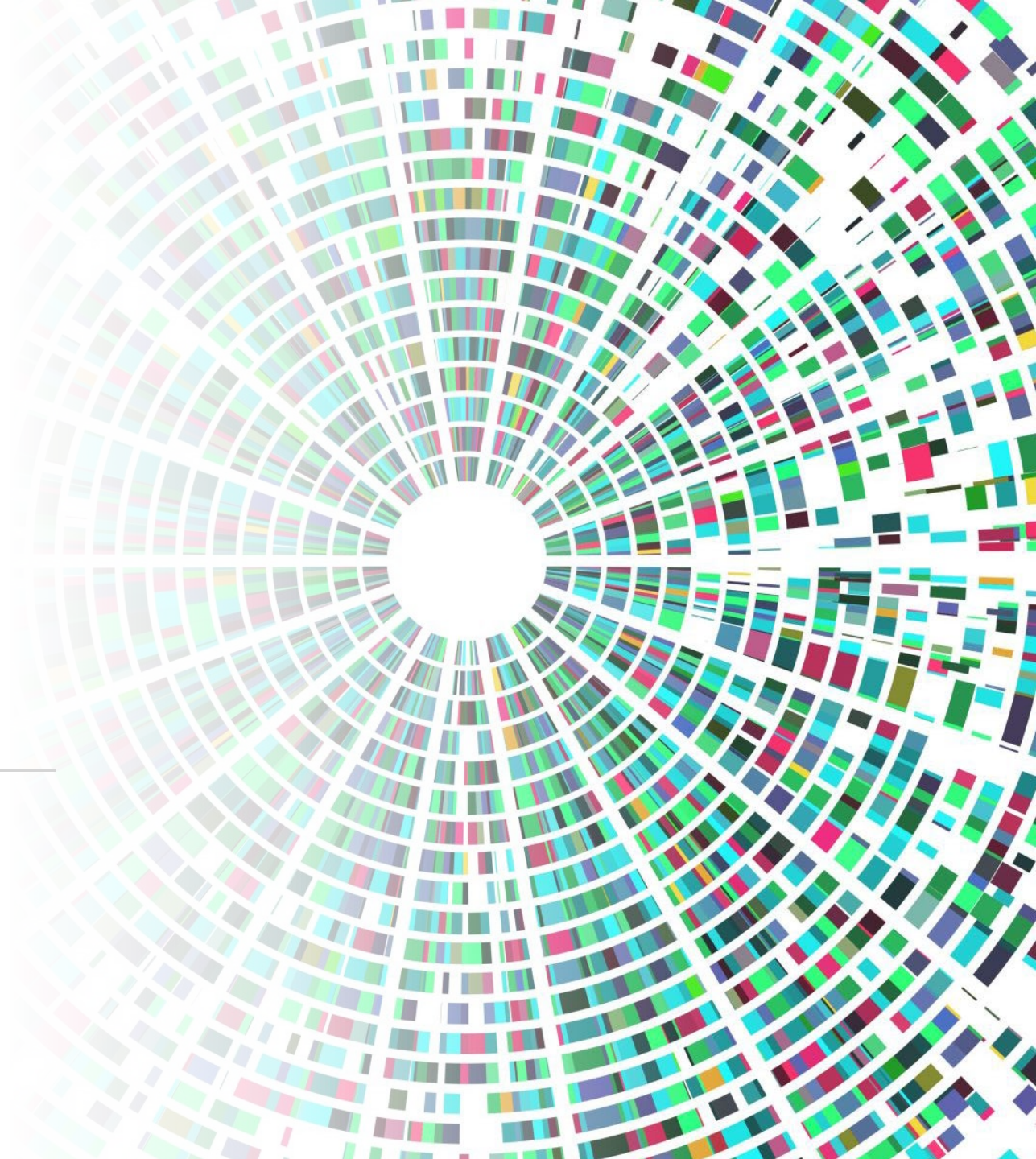
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The  
Pharmaceutical  
Society of  
Australia





# Background





# Community Pharmacy in Australia

- 5,700 Community pharmacies (25 mill)
- Regulated market
- Location and ownership rules
- Community Pharmacy Agreements
- Market differentiation
- Service implementation



# Professional Pharmacy Services

7CPA services	Pharmacy trial programs	Patient support programs	Other services
<ul style="list-style-type: none"><li>• Government funded</li></ul>	<ul style="list-style-type: none"><li>• Government funded</li></ul>	<ul style="list-style-type: none"><li>• Industry funded</li></ul>	<ul style="list-style-type: none"><li>• Patient funded</li></ul>
<ul style="list-style-type: none"><li>• Dose administration aids</li><li>• Staged supply</li><li>• MedsCheck/Diabetes MedsCheck</li><li>• Home Medicines Review/RMMR</li></ul>	<ul style="list-style-type: none"><li>• Pharmacy asthma&amp;Rhinitis</li><li>• Chronic pain MedsCheck</li><li>• Indigenous Medication Review Service</li><li>• Naloxone program (activo)</li></ul>	<ul style="list-style-type: none"><li>• MedScreen compliance</li><li>• New to Therapy</li><li>• Quality Use of Medicines</li></ul>	<ul style="list-style-type: none"><li>• BP, glucose, cholesterol monitoring</li><li>• Vaccinations</li><li>• Smoking cessation</li><li>• Weight management</li></ul>

<https://www.ppaonline.com.au/about-7cpa>

## Pharmacy practice research – A call to action

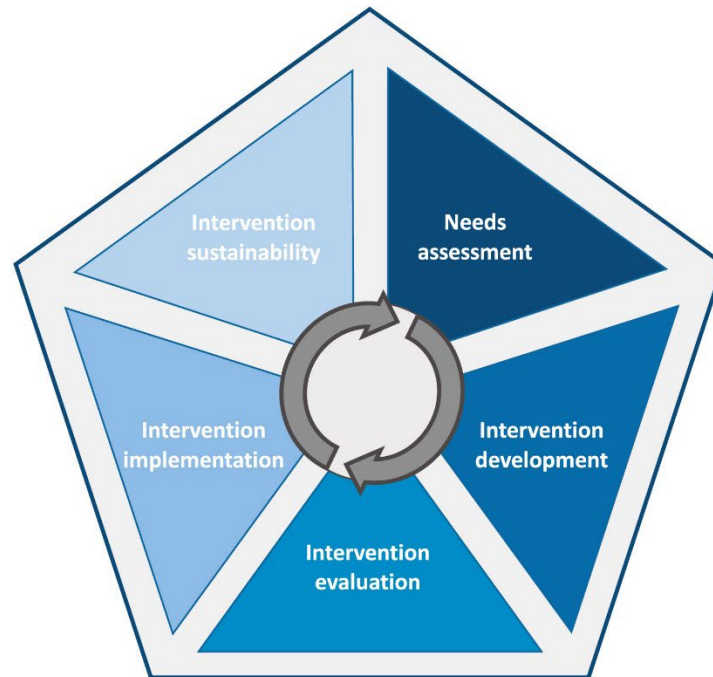
Victoria Garcia-Cardenas<sup>a,\*</sup>, Charlotte Verner Rossing<sup>a</sup>, Fernando Fernandez-Llimos<sup>b</sup>, Martin Schulz<sup>d,e</sup>, Ross Tsuyuki<sup>f</sup>, Olivier Bugnon<sup>g,h</sup>, Fernanda Stumpf Tonin<sup>i</sup>, Shalom I. Benrimoj<sup>j</sup>

### Achieving the intervention's sustainment

- Explore relevant conceptual approaches for the sustainability of the pharmacist intervention or service.
- Select mechanisms to monitor and facilitate routinization.
- Identify and address sustainability determinants.

### Incorporating interventions into practice

- Identify an adequate implementation framework, theory or model which is relevant to pharmacy practice research.
- Select an appropriate study design.
- Define implementation outcomes.



### Identifying unmet population needs

- Identify and quantify health needs that can benefit from pharmacists' care.
- Understand the nature of the problem and its determinants.
- Explore the context and the feasibility of a future pharmacist intervention or service that ensures a continuum of care.

### Designing and modelling processes and outcomes

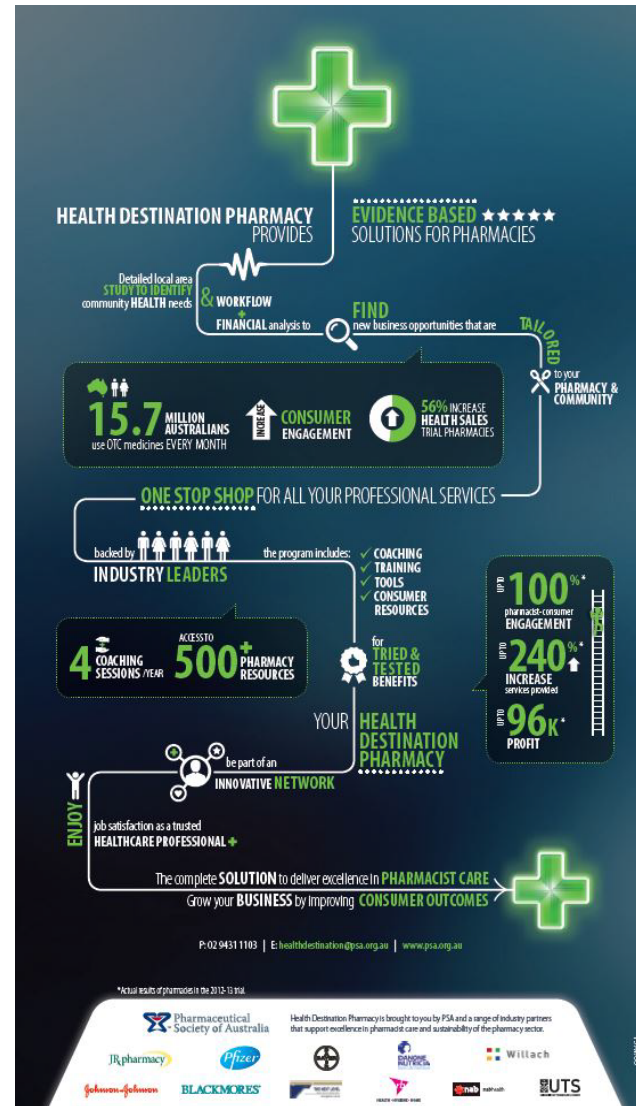
- Identify relevant evidence and other national and international pharmacist interventions and services.
- Explore theories, models, and frameworks applicable to the intervention or service model
- Identify process and outcome indicators.

### Assessing the intervention's feasibility and impact

- Select study outcomes considering different stakeholders' perspectives (ECHO model).
- Select an appropriate study design.
- Consider undertaking a feasibility study before the main trial.

Adapted from the MRC framework<sup>26</sup>

# Health Destination Pharmacy (HDP)



Objective → To reposition the pharmacist as a healthcare provider and the pharmacy as a healthcare destination



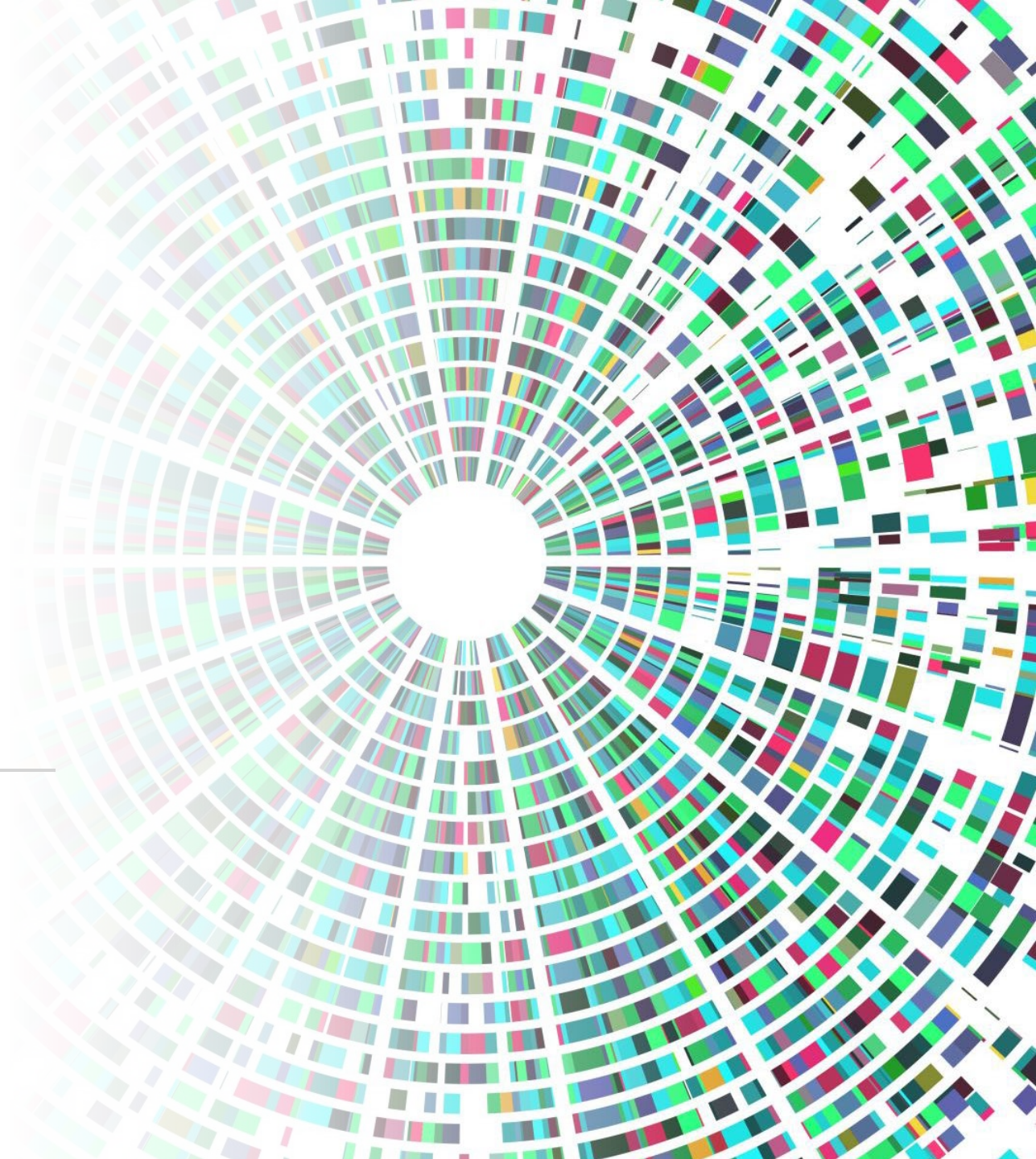
# Study objectives

- To explore implementation barriers identified by change facilitators during a 2-year implementation programme (HDP) in a community pharmacy setting.
- To predict the effectiveness of facilitation strategies to overcome implementation barriers using data-driven machine learning.





# Methods

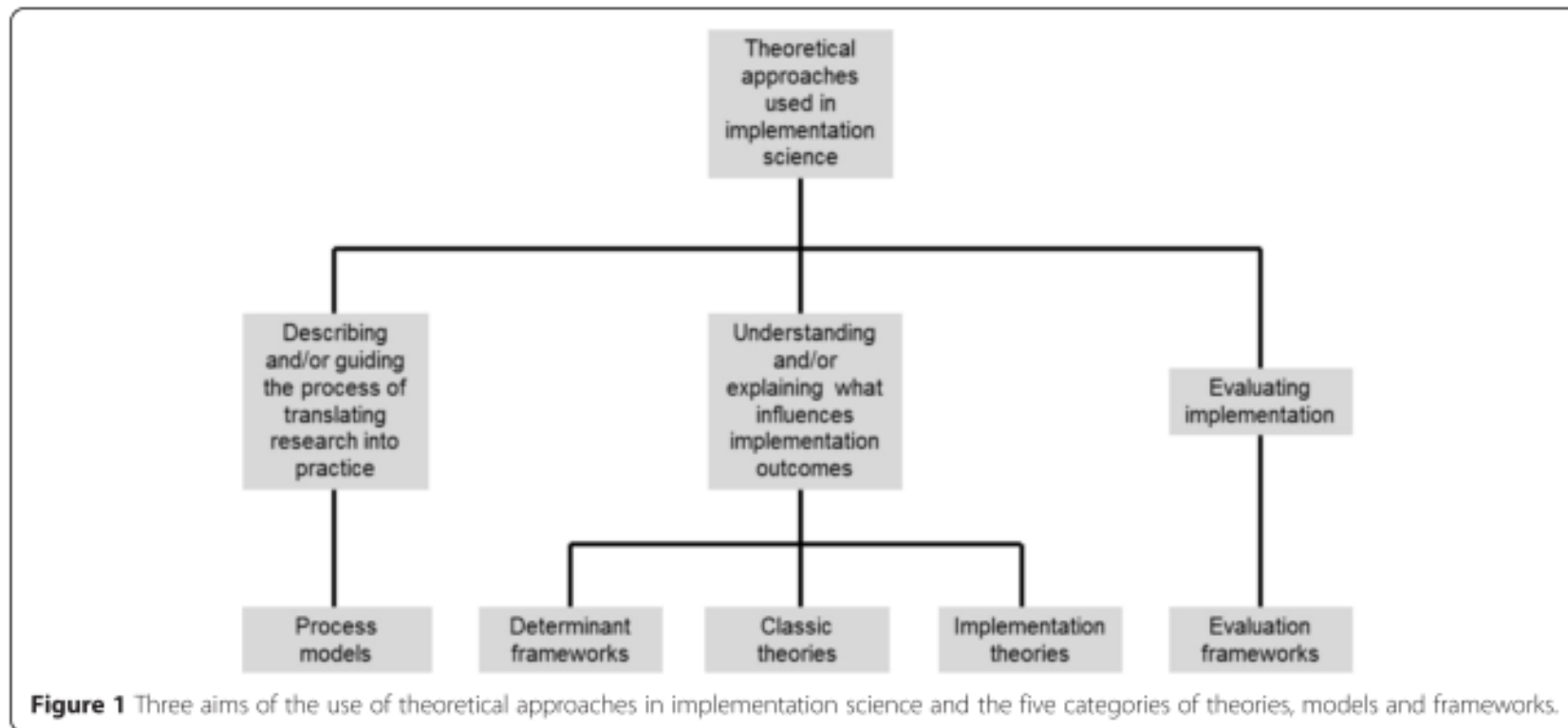


# Methods

Design: Mixed  
methods  
implementation  
study

Setting:  
Community  
pharmacies in  
Australia

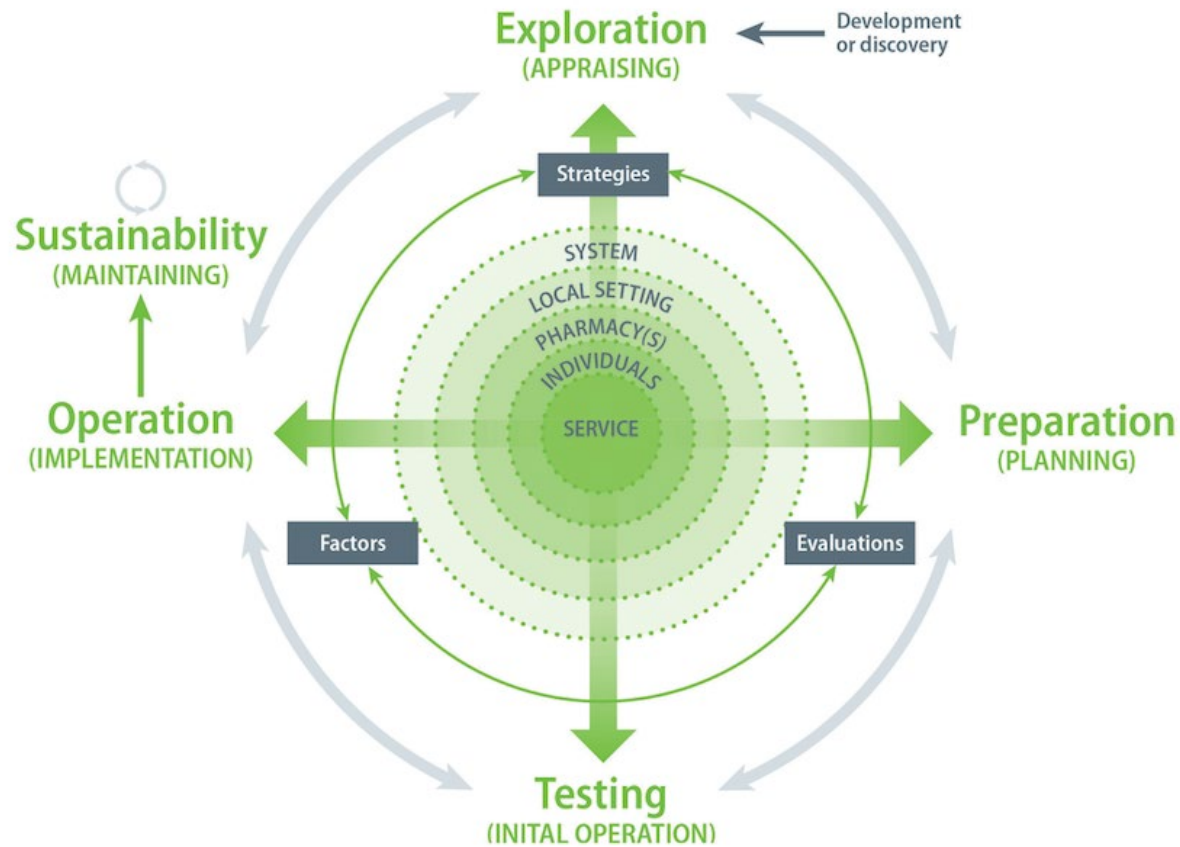
Time frame: 2  
years



Nilsen P. Making sense of implementation theories, models and frameworks. *Implement Sci* 2015;10:53.

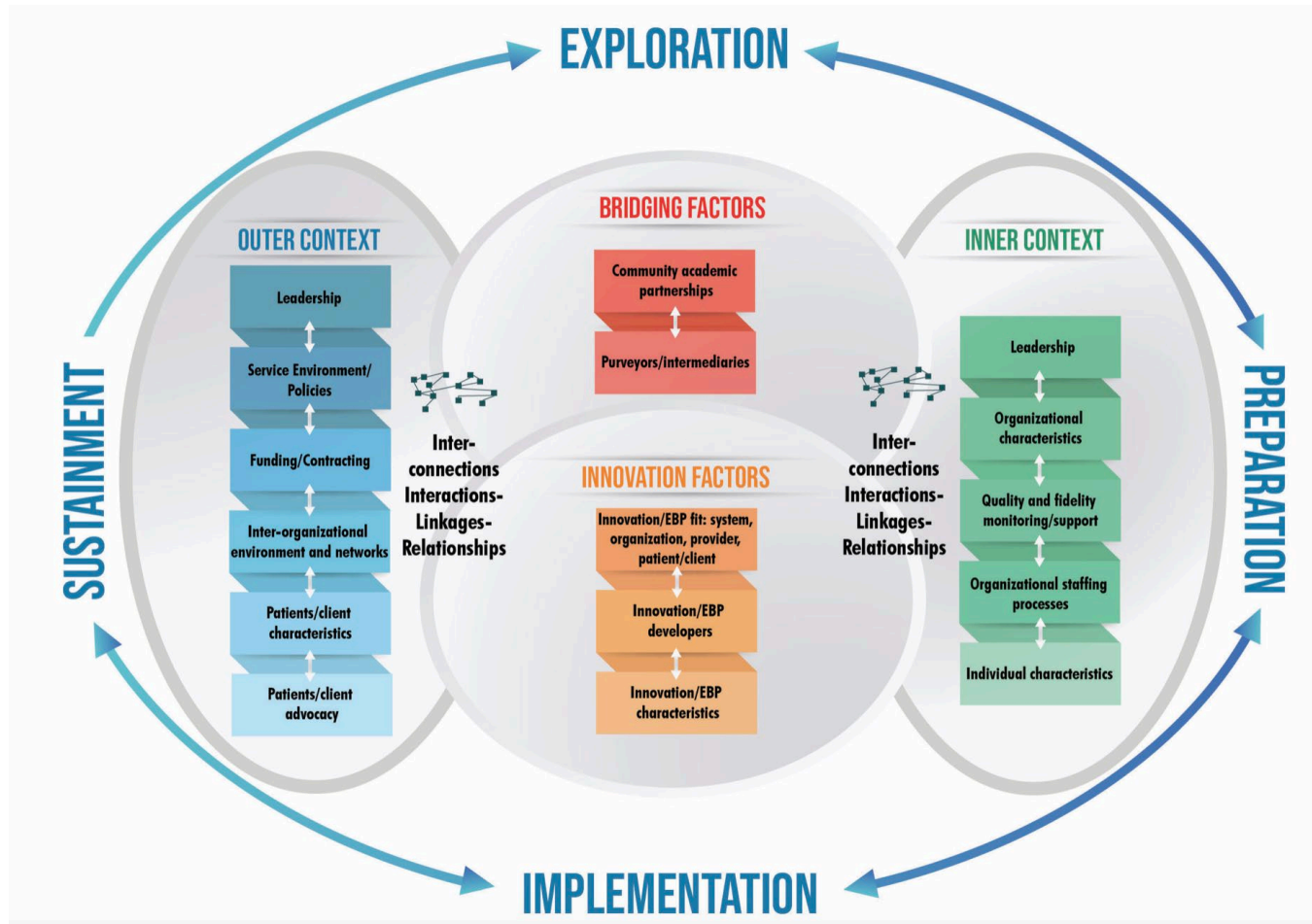


# Framework for the Implementation of Services in Pharmacy (FISpH)



# EPIS Framework

## Exploration, Preparation, Implementation, Sustainment



<https://episframework.com>

# Consolidated Framework for Implementation Research (CFIR)

Consolidated Framework for Implementation Research Constructs	
<a href="#">CFIR Website</a>	
Construct	Short Description
<b>I. INTERVENTION CHARACTERISTICS</b>	
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.

<b>II. OUTER SETTING</b>	
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 2009

<https://cfirguide.org/constructs-old/>

# Consolidated Framework for Implementation Research (CFIR)

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.
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 2009

<https://cfirguide.org/constructs-old/>



# Consolidated Framework for Implementation Research (CFIR)

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.

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.

CFIR 2009

<https://cfirguide.org/constructs-old/>

# Practice change facilitation

- (1) Individual on-site facilitation visits to the pharmacy every 3 months
- (2) Identification of implementation barriers preventing the pharmacist and the pharmacy team from successfully increasing their provision of professional services
- (3) Provision of tailored change facilitation strategies to overcome the identified implementation barriers, and
- (4) Continuous telephone follow-up and monitoring.





# Data Collection

a) Identified implementation factors that acted as barriers.

b) Facilitation strategies they used to overcome the identified barriers (qualitative data).

c) When each barrier was identified and the facilitation strategy conducted.

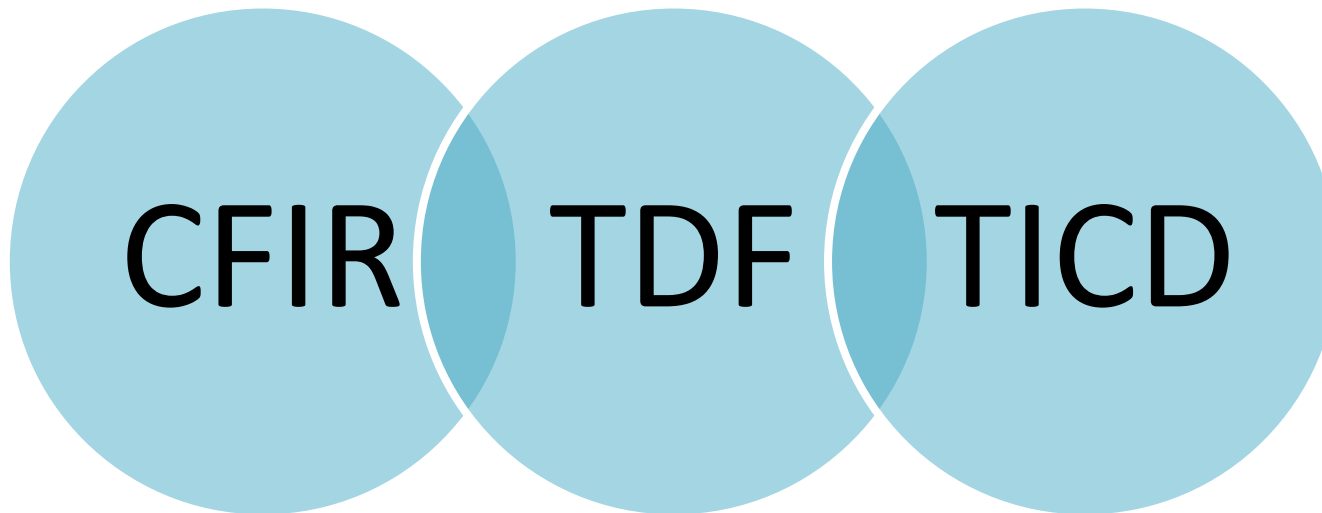
d) Whether the barrier was resolved or unresolved\*.

\*Change facilitators indicated whether the barrier was resolved based on the following criteria: (1) if an agreed upon action by the facilitator and the pharmacy team member was completed by the next pharmacy visit or follow-up phone call or (2) if an increase in the provision of professional pharmacy services was a direct result from this strategy.



# Data Coding – Implementation barriers

Implementation barriers were coded using a pre-defined list based on the CFIR<sup>1</sup>, TDF<sup>2</sup> and TICD<sup>3</sup>



1. Damschroder LJ, Hagedorn HJ. A guiding framework and approach for implementation research in substance use disorders treatment. *Psychol Addict Behav.* 2011, 25(2):194–205.

2. Cane J, O'Connor D, Michie S. Validation of the theoretical domains framework for use in behaviour change and implementation research. *Implement Sci.* 2012 Apr 24;7(1):37.

3. Flottorp SA, Oxman AD, Krause J, Musila NR, Wensing M, Godoycki-Cwirko M, Baker R, Eccles MP. A checklist for identifying determinants of practice: a systematic review and synthesis of frameworks and taxonomies of factors that prevent or enable improvements in healthcare professional practice. *Implement Sci.* 2013. 23;8:35.

# Data coding – Facilitation Strategies

Facilitation strategies were mapped according to those identified from two systematic reviews<sup>1,2</sup> and labeled with an outcome (effective/not effective)

Primary category*	Secondary category*		Tertiary category^
<b>1. Awareness of need to change (Highlighting a need for practice change)</b>	<b>1.1 Interpret baseline data and provide feedback/ insight into performance gaps</b>	<b>1.1.1</b>	Audit feedback via written report
		<b>1.1.2</b>	Audit feedback via visual presentation
		<b>1.1.3</b>	Audit feedback via verbal presentation
	<b>1.2 Assist with/ perform a formal/ informal practice audit</b>	<b>1.2.1</b>	Observations
		<b>1.2.2</b>	Interviews
		<b>1.2.3</b>	Questionnaires
		<b>1.2.4</b>	Surveys
		<b>1.2.5</b>	Patient chart audits
		<b>1.2.6</b>	Financial analysis
		<b>1.2.7</b>	Performance evaluation
		<b>1.2.8</b>	Self-evaluations
<b>1.2.9</b>		Local area demographic	

1. Dogherty EJ, Harrison MB, Graham ID. Facilitation as a role and process in achieving evidence-based practice in nursing: a focused review of concept and meaning. *Worldviews Evid-Based Nurs*. 2010 Jun 1;7(2):76–89.

2. Moussa L, Garcia-Cardenas V, Benrimoj SI. Change facilitation strategies used in the implementation of innovations in healthcare practice: a systematic review null. 2019 Oct 2;19(4):283–301.

# Data coding – Facilitation Strategies

Primary category*	Secondary category*		Tertiary category^
2. Preparing participants for change	2.1 Create a collaborative environment conducive to change	2.1.1	Organising meetings (no coach present)
		2.1.2	Leading meetings (coach present on premises)
		2.1.3	Leading virtual meeting (coach present digitally e.g. webinar or skype)
	2.2 Encourage participation & facilitate discussions among stakeholders	2.2.1	Ask each person for their feedback regarding the change
		2.2.2	Encourage role modeling by leadership
		2.2.3	Ask each person for their feedback regarding the change
	2.3 Ensure stakeholders contribute to the change	2.3.1	Acknowledge ideas
		2.3.2	Encouraging knowledge and experience sharing
		2.3.3	Involve others in the change process
		2.3.4	Acknowledge importance of participant roles
	2.4 Create buy-in among stakeholders	2.4.1	Addressing specific concerns
		2.4.2	Comparison of audit results to network benchmarking
		2.4.3	Emphasising enhanced customer outcomes as opposed to poor practice as reason for change
		2.4.4	Outlining negative impacts (using evidence)
		2.4.5	Outlining negative impacts (using opinion)
		2.4.6	Outlining benefits (using evidence)
		2.4.7	Outlining benefits (using opinion)
		2.4.8	Asking about barriers to change
		2.4.9	Motivate using stories
	2.5 Communicate the change to stakeholders	2.5.1	Verbally to group
		2.5.2	Verbally to individual
2.5.3		Visual display (Poster)	
2.5.4		Written document (email, letter etc)	
2.5.5		Explain the change	
2.5.6		Define the change objectives	

# Data coding – Facilitation Strategies

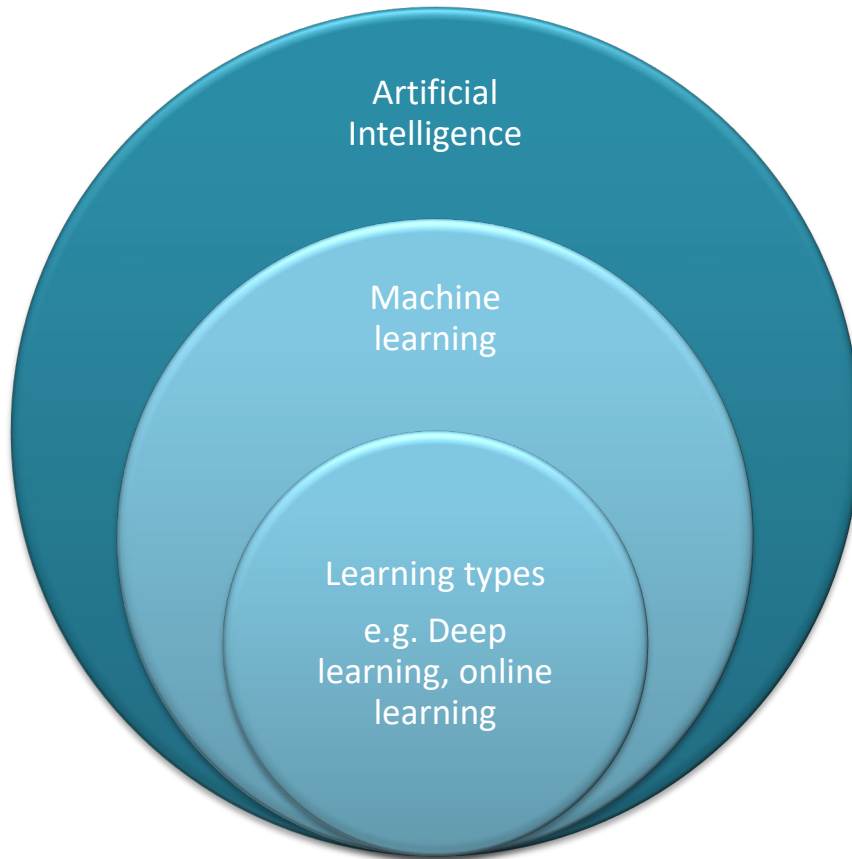
Primary category*	Secondary category*		Tertiary category^	
3. Planning for/ managing change	3.1 Empower stakeholders to develop objectives and solve problems	3.1.1	Stimulating critical inquiry/ critical reflection	
		3.1.2	Think-aloud process	
	3. Planning for/ managing change	3.4 Engage stakeholders by creating ownership of the change		<b>Tertiary category^</b>
			3.4.1	Establishing/ allocating roles
			3.4.2	Delegating responsibilities
			3.4.3	Allocating primary champion
			3.4.4	Key performance indicators
			3.4.5	Ask for commitment to the agreed changes
			3.4.6	Encourage collaboration and teamwork
			3.4.7	Performance review (recommend or aid in conducting)
			3.4.8	Allocate roles based on skills/ interests
			3.4.9	Allocate supporting champions
		3.4.10	Emphasise the importance of delegating	
		3.5 Equip stakeholders with training	3.5.1	Skills/technical training
			3.5.2	Knowledge training
3.5.3	Role-playing/ role modelling			
3.5.4	Bringing subject matter expert			
3.5.5	Refer to external formal education/ training			
3.5.6	Using case studies			
3.6 Equip stakeholders with resources	3.5.7	Staff scoping and training tool		
	3.5.8	Encourage discussion of training topic as a group (workshop)		
	3.5.9	Create/ adapt training plan		
	3.5.10	Determine training gaps		
	3.5.11	Encourage self-learning (e.g reading of journals etc)		
3.3 sett	3.6 Equip stakeholders with resources	3.6.1	Gathering information	
		3.6.2	Assembling/providing reports	
		3.6.3	Practical assistance	
		3.6.4	Providing bibliographical resources	
		3.6.5	Advocating for resources	
		3.6.6	Cost-analysis (resources)	
		3.6.7	Assess existing resource	
		3.6.8	Reminder system (electronic or visual)	
3.2 nee				



# Data coding – Facilitation strategies

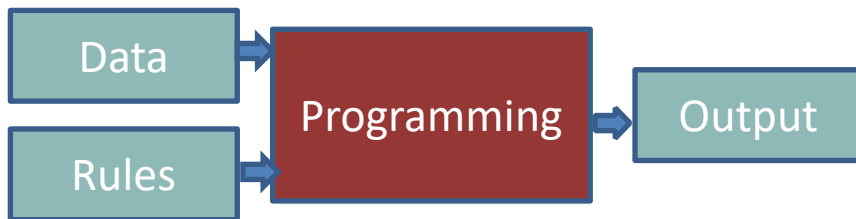
Primary category*	Secondary category*		Tertiary category^
4. Monitoring of change	4.1 Ensure continuous monitoring of implementation measures	4.1.1	Monitor financial impact
		4.1.2	Customer outcomes
		4.1.3	Service provision
		4.1.4	Staff measures
		4.1.5	Emphasise ongoing monitoring by participants
		4.1.6	Monitor agreed upon plan/ objectives
		4.1.7	Display progress chart
	4.2 Feedback progress of implementation measures	4.2.1	Provide constructive feedback
		4.2.2	Acknowledge success/ recognise /celebrate achievements
		4.2.3	Providing ongoing encouragement
	4.3 Ensure ongoing communication method	4.3.1	Email
		4.3.2	Phone calls
		4.3.3	Face to face

# Data Analysis

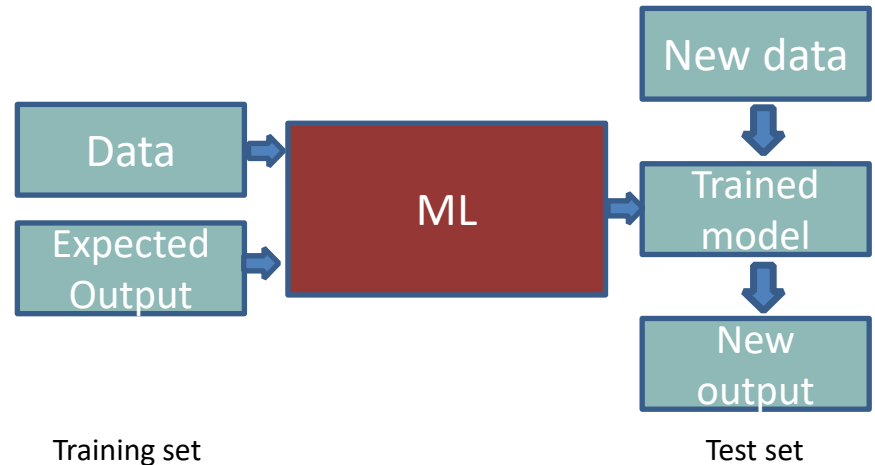


# Data Analysis

- Traditional Approach



- Machine Learning

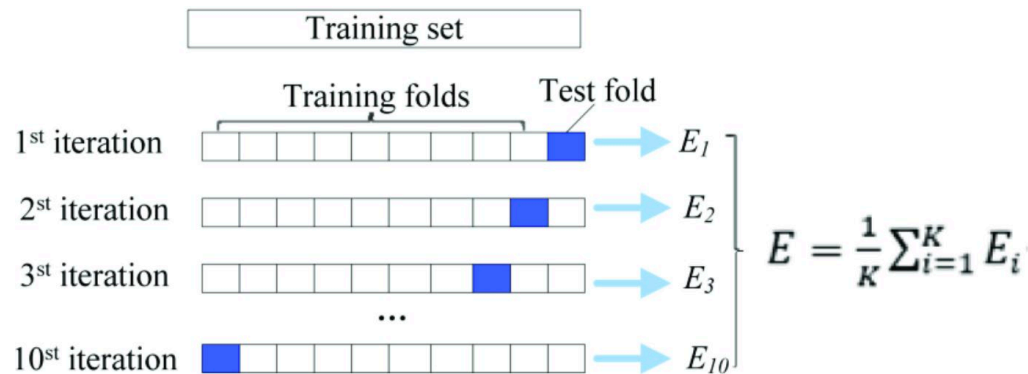


Supervised → To predict a category, label or numerical data based on a structured dataset

Unsupervised → To understand and summarize a dataset without categories, labels, numerical data

# Data Analysis

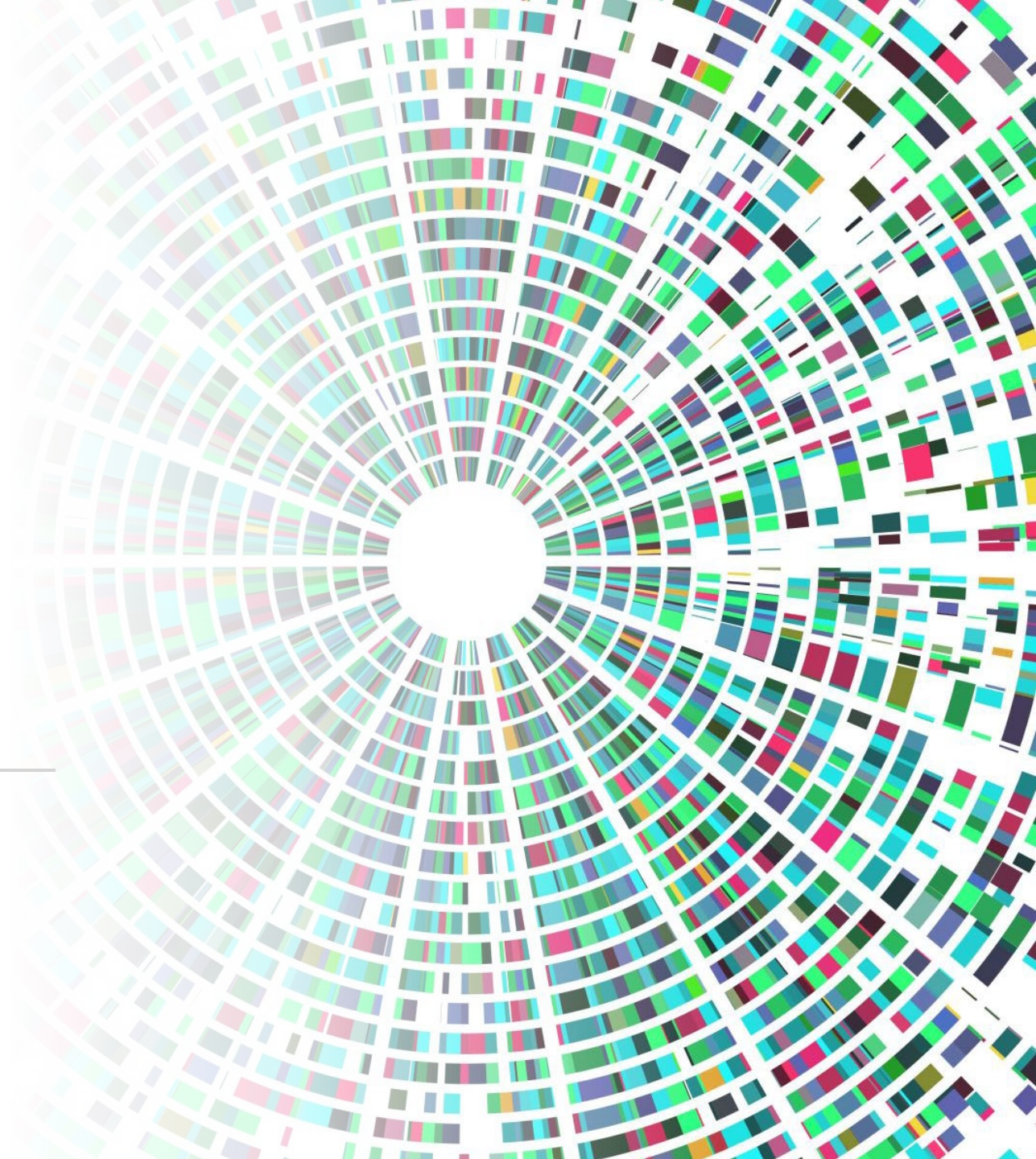
- Machine learning with random forest (RF) used as a supervised classification method for predicting effective strategies → Explainability and accuracy.
- A predictive resolution percentage (PRP) was given to each of the facilitation strategies.
- Algorithm → Used to rank the facilitation of strategies in order of PRP's. The higher the PRP, the more likely that the strategy was predicted to overcome the related barrier.
- 10-fold cross-validation technique was adopted.







# Results





# Results

19 pharmacies participated in the change programme.

Located across Australia (average prescriptions per year: 93,239, min: 23,954 max: 223,269)

Employees ranged from a minimum of two to a maximum of 46 staff members.

Six change facilitators

# Results



1,130 barriers identified and associated facilitation strategies.



The random forest algorithm used was able to provide 96.9% accuracy in predicting the most effective strategies.



Results → strategies used to address the top 20% (n=7) most common implementation barriers identified<sup>1</sup>

Pareto's principle was used. Pareto's principle states that, for many events, roughly 80% of the effects come from 20% of the causes.

Craft RC, Leake C. The Pareto principle in organizational decision making. *Manag Decis.* 2002 Jan 1;40(8):729–33.

# Results – Most common barriers

Barrier	Definition	Source	
Inability to plan for change	The extent to which the targeted healthcare professionals are able to plan necessary changes in order to adhere	TICD	184 times 16/19 pharmacies
Lack of internal supporters to change	Lack of support provided by the staff members for the implementation of the change	TICD	128 times 18/19 pharmacies
Lack of knowledge and experience	The extent to which the targeted individuals have skills, knowledge and experience that they need to adhere	TDF	84 times 18/19 pharmacies
Lack of monitoring and feedback	The extent to which monitoring and feedback are needed at an organisational level and available to sustain necessary changes	TICD	61 14/19 pharmacies
Lack of individual alignment with the change'	The degree of tangible fit between meaning and values attached to the change by involved individuals' own norms, values, perceived risks and needs	CFIR	49 times 14/19 pharmacies
Undefined change objectives and lack of objective feedback	The degree to which implementation objectives have been defined, communicated and achieved by the members of the team	TICD	46 times 16/19 pharmacies.
Lack of time (i.e. available resources)	The level of resources dedicated for implementation and on-going operations, including money, training, education, physical space, and time.	CFIR	43 times 15/19 pharmacies

# Facilitation strategies more likely to be effective

Table 1

Facilitation categories used to overcome common implementation barriers in community pharmacy

Most common barriers to implementing professional services in community pharmacy <sup>^</sup>	Strategy categories* used by Change Facilitators to overcome implementation barriers	The Predictive Resolution Percentage of the strategy category resolving the barrier (PRP) <sup>a</sup>
An inability to plan for change (n = 184)	Engage stakeholders by creating ownership of the change	84%
	Equip stakeholders with training	83%
	Adapt area of focus to meet change needs	81%
A lack of internal supporters of the change (n = 128)	Engage stakeholders by creating ownership of the change	78%
	Empower stakeholders to develop objectives and solve problems	73%
	Create buy-in of the change among stakeholders	58%
A lack of knowledge and experience related to the change (n = 84)	Create a collaborative environment conducive of change	99%
	Equip stakeholders with training	93%

# Facilitation strategies more likely to be effective

Table 1  
Facilitation categories used to overcome common implementation barriers in community pharmacy

Most common barriers to implementing professional services in community pharmacy <sup>A</sup>	Strategy categories* used by Change Facilitators to overcome implementation barriers	The Predictive Resolution Percentage of the strategy category resolving the barrier (PRP) <sup>a</sup>
A lack of monitoring and feedback of the change (n = 61)	Feedback implementation progress	99%
	Ensure continuous monitoring of implementation measures	68%
A lack of individual alignment with the change (n = 49)	Encourage participation & facilitate discussions among stakeholders	99%
	Empower stakeholders to develop objectives and solve problems	83%
Undefined change objectives and lack of objective feedback (n = 46)	Create buy-in of the change among stakeholders	83%
	Engage stakeholders by creating ownership of the change	82%
	Empower stakeholders to develop objectives and solve problems	81%
A lack of time (n = 43)	Communicate the change to stakeholders	63%
	Adapt area of focus to meet change needs	79%
	Empower stakeholders to develop objectives and solve problems	62%

Moussa L, Benrimoj S, Musial K, Kocbek S, Garcia-Cardenas V. Data-driven approach for tailoring facilitation strategies to overcome implementation barriers in community pharmacy. *Implement Sci.* 2021;16(1):73



# Facilitation strategies more likely to be effective

**Table 2** Facilitation strategies used by change facilitators to overcome common implementation barriers in community pharmacy

Strategy category to overcome barrier*	Facilitation strategies within category	Most common barriers overcome using this strategy category (PRP) <sup>a</sup>
<b>Empower stakeholders to develop objectives and solve items</b>	<ul style="list-style-type: none"> <li>Stimulate critical inquiry/ critical reflection</li> <li>Utilise think-aloud process</li> <li>Utilise brainstorming techniques</li> <li>Outlining opportunities presented by change</li> <li>Conduct a needs analysis</li> <li>Conduct a Strength, Weaknesses, Opportunities and Threats (SWOT) analysis</li> <li>Use prioritisation techniques</li> <li>Introduce goal-setting (SMART goals)</li> <li>Use consensus-building/shared decision-making</li> <li>Providing solutions/advice</li> <li>Create/ recommend the creation of a monthly or annual plan</li> <li>Ensure win/win goals (mutually beneficial solutions)</li> <li>Use an action planner tool</li> <li>Use a mind-mapping tool</li> <li>Discuss/ outline best practices</li> </ul>	<ul style="list-style-type: none"> <li>An inability to plan for change (80.64%)</li> <li>A lack of internal supporters of the change (73.44%)</li> <li>A lack of individual alignment with the change (83.13%)</li> <li>Undefined change objectives and lack of objective feedback (80.55%)</li> <li>A lack of time (62.25%)</li> </ul>
<b>Engage stakeholders by creating ownership of the change</b>	<ul style="list-style-type: none"> <li>Establish/ allocate roles</li> <li>Delegate responsibilities</li> <li>Allocate primary champion and/or supporting champions</li> <li>Define key performance indicators</li> <li>Ask for commitment to the agreed changes</li> <li>Encourage collaboration and teamwork</li> <li>Recommend or aid in conducting a performance review</li> <li>Allocate roles based on skills/ interests</li> <li>Emphasise the importance of delegating</li> </ul>	<ul style="list-style-type: none"> <li>An inability to plan for change (84.23%)</li> <li>A lack of internal supporters of the change (78.29%)</li> <li>A lack of individual alignment with the change (49.38%)</li> </ul>
<b>Equip stakeholders with training</b>	<ul style="list-style-type: none"> <li>Provide/recommend skills/technical training</li> <li>Provide knowledge training</li> <li>Conduct/ recommend role-playing/role modelling</li> <li>Bringing subject matter expert</li> <li>Refer to external formal education/training</li> <li>Using case studies</li> <li>Use a staff scoping and training tool</li> <li>Encourage discussion of training topic as a group</li> <li>Create/adapt training plan</li> <li>Determine training gaps</li> <li>Encourage self-learning (eg reading of journals)</li> </ul>	<ul style="list-style-type: none"> <li>A lack of knowledge and experience related to the change (93.44%)</li> <li>An inability to plan for change (83.30%)</li> </ul>
<b>Adapt area of focus to meet change needs</b>	<ul style="list-style-type: none"> <li>Adapt task allocations by creating a roster to align with change</li> <li>Improve workflow by adapting layout to cater for change</li> <li>Adapt vision/mission to align for change</li> <li>Review roles to align with change requirements</li> <li>Create time-tabling (annual, monthly or weekly time tables)</li> <li>Adapt business strategy plan to the change</li> <li>Adapt image of organisation towards new changes</li> <li>Create/adapt communication plan to new changes</li> <li>Adapt process/procedures to new changes</li> <li>Encourage regular communication amongst participants to ensure everyone is aligned to new changes</li> </ul>	<ul style="list-style-type: none"> <li>An inability to plan for change (81.17%)</li> <li>A lack of time (79.09%)</li> </ul>
<b>Create buy-in amongst stakeholders</b>	<ul style="list-style-type: none"> <li>Ask about individual concerns regarding the change</li> <li>Address specific individual concerns related to the change</li> <li>Motivate group/individuals using stories</li> <li>Compare audit results to network benchmarking results</li> <li>Emphasise enhanced customer outcomes as opposed to poor practice</li> <li>Outline negative impacts to lack of implementation (using evidence/opinion)</li> <li>Outlining benefits of implementation (using evidence/ opinion)</li> </ul>	<ul style="list-style-type: none"> <li>A lack of individual alignment with the change (82.86%)</li> <li>A lack of internal supporters of the change (67.90%)</li> </ul>
<b>Create a collaborative environment conducive to change</b>	<ul style="list-style-type: none"> <li>Organise or conduct meetings (face-to-face)</li> <li>Lead virtual meeting (coach present digitally e.g. webinar or skype)</li> </ul>	<ul style="list-style-type: none"> <li>A lack of knowledge and experience related to the change (99.80%)</li> </ul>

**Table 2** Facilitation strategies used by change facilitators to overcome common implementation barriers in community pharmacy

(Continued)

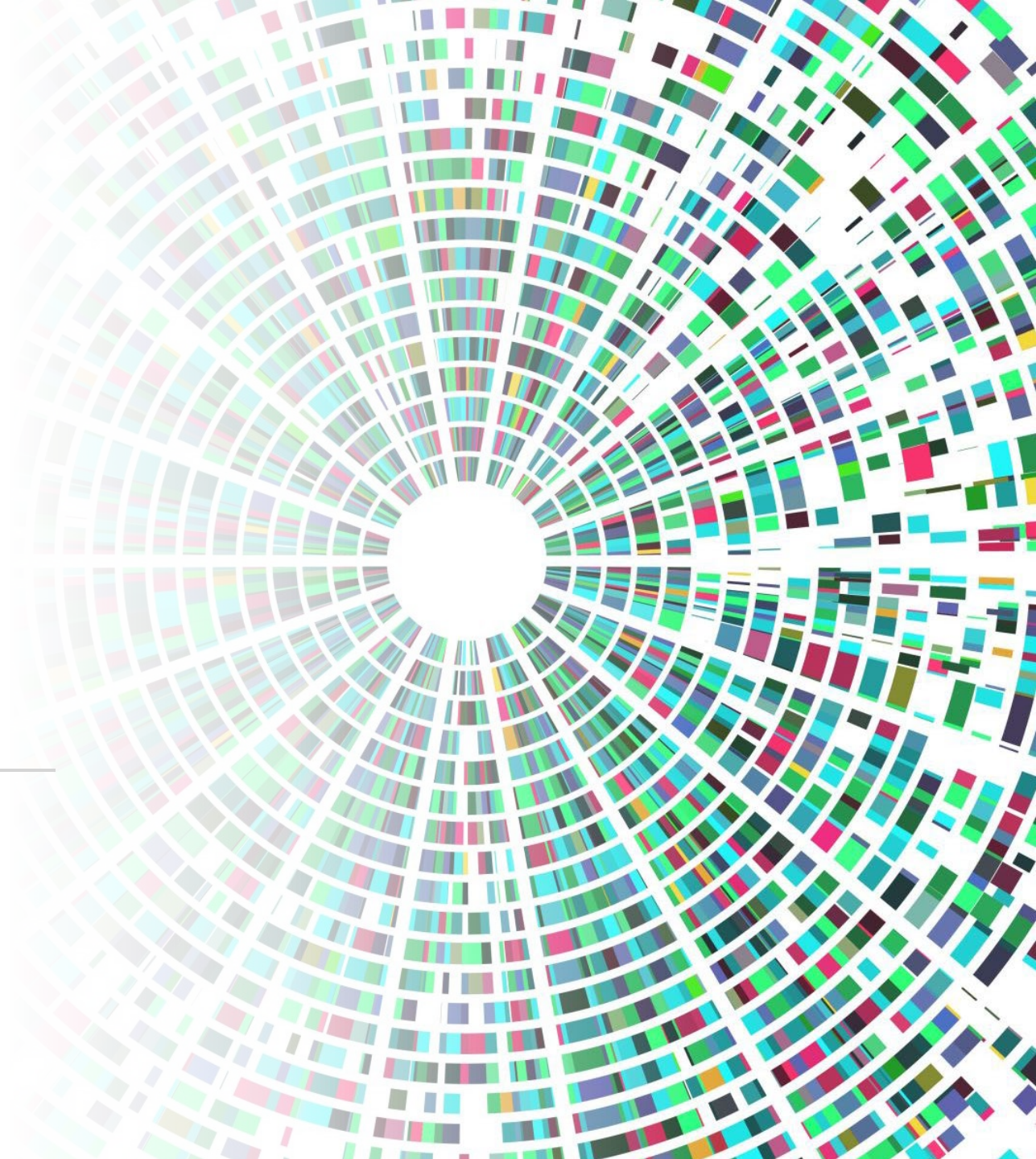
Strategy category to overcome barrier*	Facilitation strategies within category	Most common barriers overcome using this strategy category (PRP) <sup>a</sup>
<b>Feedback progress of implementation measures</b>	<ul style="list-style-type: none"> <li>Provide constructive feedback</li> <li>Acknowledge success/recognise/celebrate achievements</li> <li>Provide ongoing encouragement</li> </ul>	<ul style="list-style-type: none"> <li>A lack of monitoring and feedback regarding the change (99.12%)</li> </ul>
<b>Ensure stakeholders contribute to the change</b>	<ul style="list-style-type: none"> <li>Acknowledge ideas</li> <li>Encourage knowledge/experience sharing</li> <li>Involve others in the change process</li> <li>Acknowledge the importance of individuals' roles</li> </ul>	<ul style="list-style-type: none"> <li>A lack of individual alignment with the change (88.79%)</li> </ul>
<b>Ensure continuous monitoring of implementation measures</b>	<ul style="list-style-type: none"> <li>Monitor financial impact</li> <li>Measure and monitor customer outcomes</li> <li>Monitor service provision</li> <li>Monitor Staff measures</li> <li>Emphasise ongoing monitoring by stakeholders</li> <li>Monitor agreed upon plan/objectives</li> <li>Display progress chart</li> </ul>	<ul style="list-style-type: none"> <li>A lack of monitoring and feedback of the change (68.09%)</li> </ul>
<b>Communicate the change to stakeholders</b>	<ul style="list-style-type: none"> <li>Inform the entire group of the change and objectives verbally</li> <li>Inform individuals of the change and objectives verbally</li> <li>Inform using a visual display such as poster</li> <li>Inform using a written document (email, letter, etc).</li> </ul>	<ul style="list-style-type: none"> <li>Undefined change objectives and lack of objective feedback (62.83%)</li> </ul>

\*The strategy categories were adapted from the taxonomy of facilitation strategies (Doherty et al)

<sup>a</sup> PRP is the predictive resolution percentage is based on random forest which uses data collected by change facilitators indicating whether the extent which the strategy is predicted to resolve the barrier



# Limitations and Conclusion



# Limitations



Amount of data → >data  
>predictive accuracy



Number of pharmacies and  
representativeness



Qualitative data and data  
coding



Combination of strategies

# Conclusion

Implementation barriers in community pharmacy: Inability to plan for change, lack of internal supporters of the change and a lack of knowledge and experience regarding the change.

Predicted effective strategies: empower pharmacy teams to develop objectives and solve problems, engage teams by creating ownership, and equip teams with training.

Study outcomes shape:

- How change facilitators can more effectively implement tailored facilitation strategies
- Future implementation projects for more efficient implementation of innovations



An aerial photograph of a multi-lane highway bridge spanning across a body of turquoise water. The bridge has several lanes in each direction, with white lane markings. Several vehicles, including cars and trucks, are visible on the bridge. The water is a vibrant greenish-blue color with gentle ripples. The text "Thank you for your attention!" is overlaid in the center of the image in a white, bold, sans-serif font with a slight drop shadow.

**Thank you for your attention!**





**Any questions?**



# IMPACT

SWISS IMPLEMENTATION SCIENCE NETWORK

## Using artificial intelligence to facilitate the implementation of services in community pharmacy

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