

# IMPLEMENTATION SCIENCE IN COMMUNITY PHARMACY

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Development of frameworks, models and tools  
for introducing and integrating professional  
services

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# COMMUNITY PHARMACY

~ 47 million population

21 854 community pharmacies

68 381 pharmacists

~ 2 150 people/pharmacy

~ 3.1 pharmacists/  
pharmacy

~ 8 million population

1 744 community pharmacies

~ 4 300 pharmacists

~ 4 600 people/pharmacy

~ 2.5 pharmacists/  
pharmacy

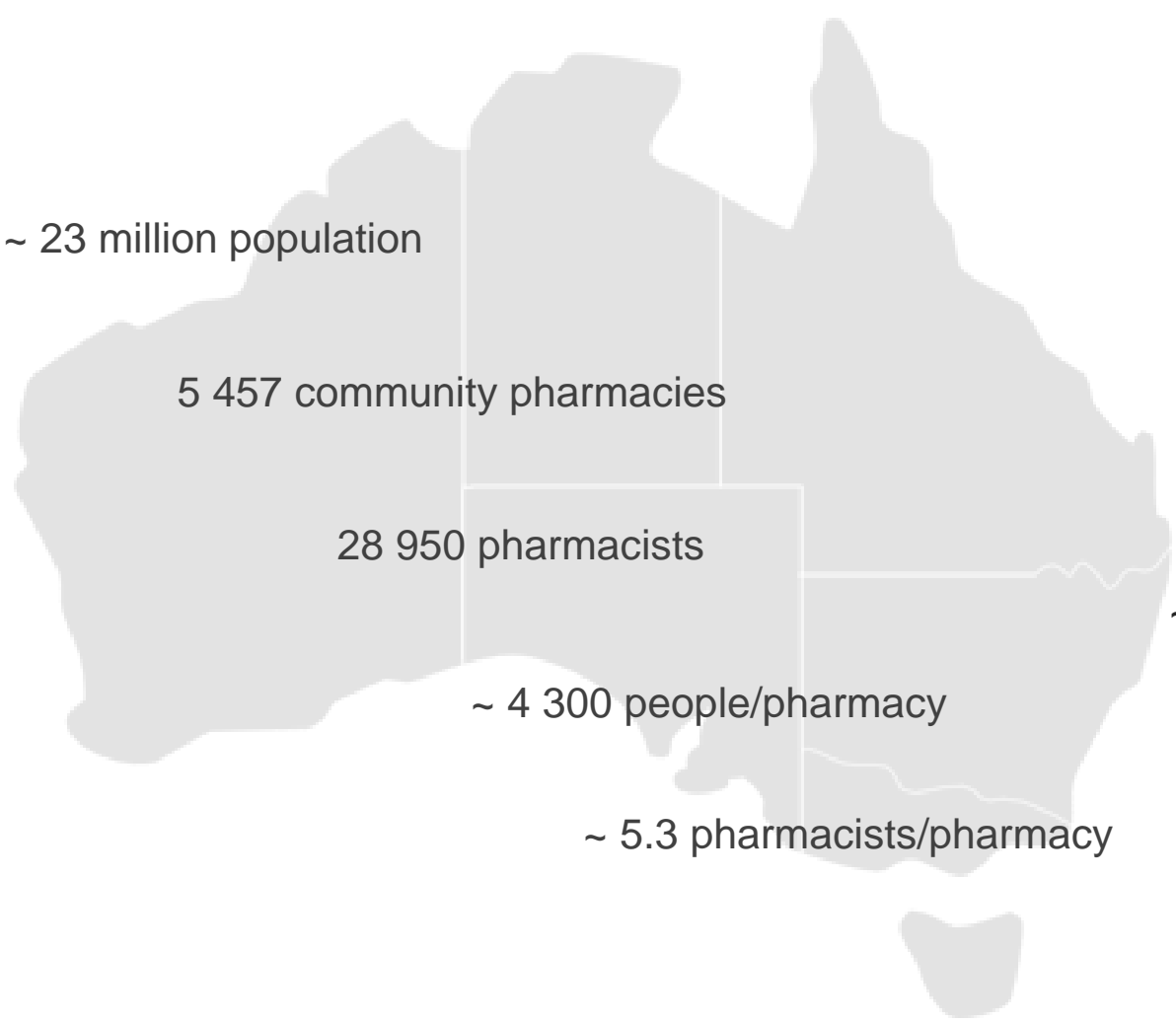
~ 23 million population

5 457 community pharmacies

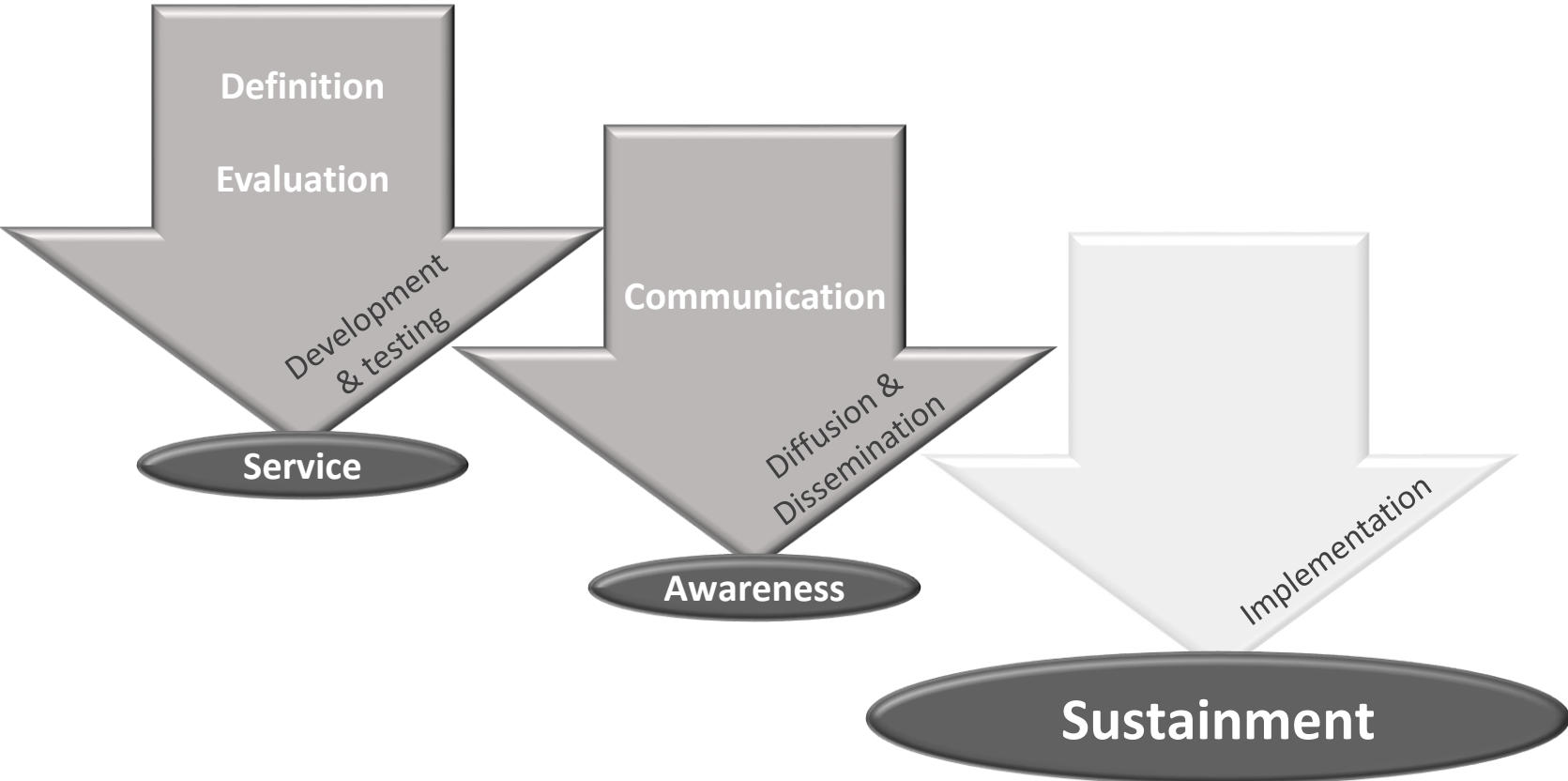
28 950 pharmacists

~ 4 300 people/pharmacy

~ 5.3 pharmacists/pharmacy



# EVIDENCE PATHWAY



# PROFESSIONAL PHARMACY SERVICES

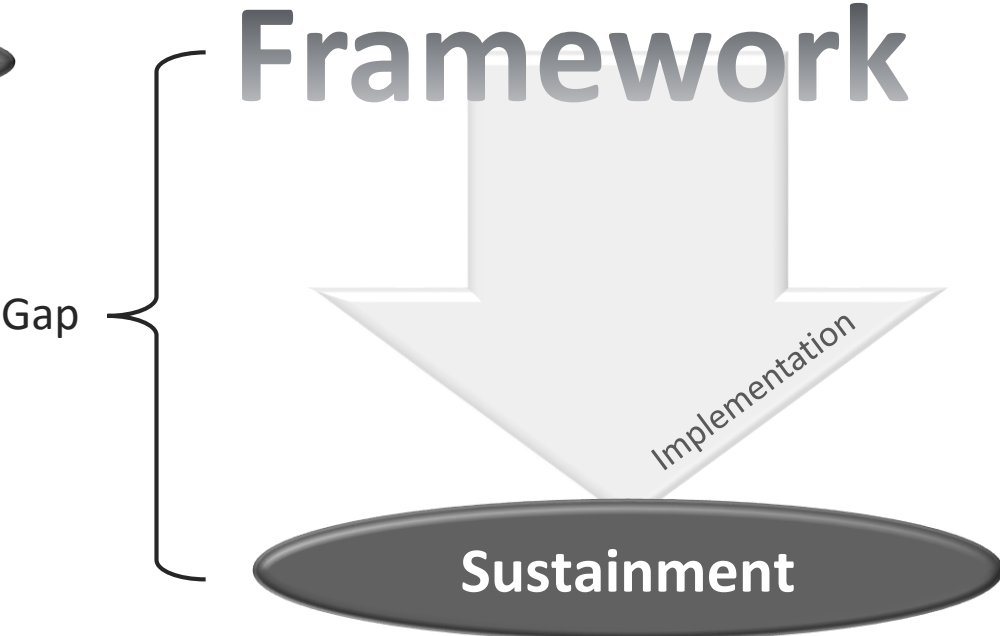
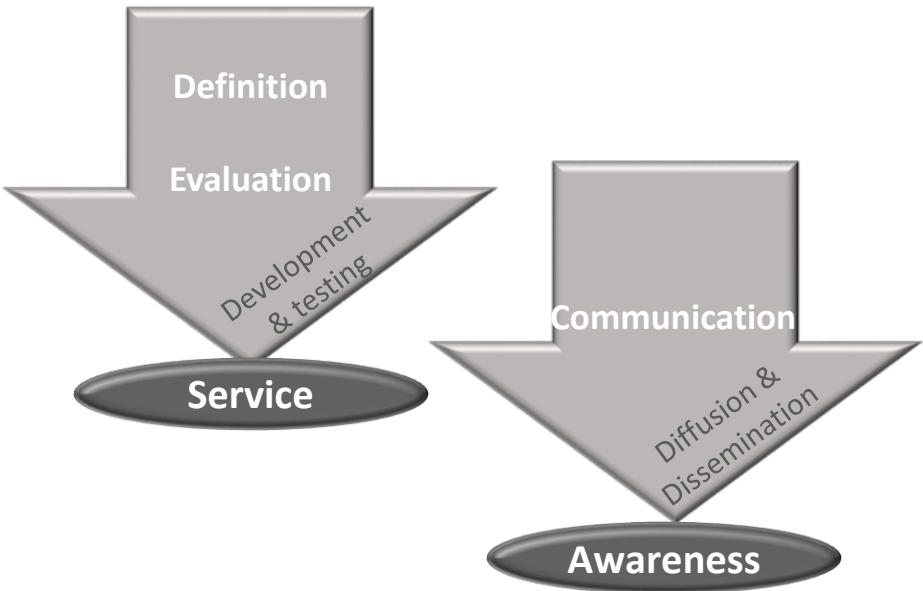
## Hierarchical Model of Cognitive Pharmaceutical Services

1. Medicines Information
2. Compliance, adherence and/or concordance
3. Disease screening
4. Disease prevention
5. Clinical intervention or drug related problems
6. Medication Use Reviews (MUR)
7. Medication Management/Medication Therapy Management
  - a. Home Medication Review (HMR)
  - b. Residential Care Medication Reviews (RMMR)
  - c. Medication Review with follow-up (Seguimiento Farmacoterápéutico, SFT)
8. Disease State Management for Chronic Conditions
9. Participation in Therapeutic Decisions with Medical Practitioners
  - a. Clinical setting
  - b. Pharmacy setting
10. Prescribing
  - a. Supplementary
  - b. Dependent

# MEDICATION REVIEW

- ✓ Aim defined
- ✓ Types classified
- ✓ Clinical effectiveness studied
- ✓ Cost-effectiveness studied
  
- X Fidelity of provision
- X Reach including representativeness
- X Degree of integration into practice
- X Cost of implementation
- X Effectiveness of implementation strategies
  
- We don't know the "real World" situation

# EVIDENCE PATHWAY



# JUSTIFICATION

- There is an international movement towards the development, diffusion, implementation and sustainability of professional pharmacy services, however there appears to be an pervasive struggle to achieving widespread integration into routine practice.<sup>1</sup>
- There appears to be no theoretical framework that incorporates all the elements that are involved in the implementation process in the community pharmacy setting.<sup>2</sup>
- Together with a theoretical framework there is a need for a model for the evaluation to be designed to assess the implementation and provision of such services.<sup>3</sup>
- A practical application of implementation frameworks, models and tools for the implementation of professional pharmacy services is to provide researchers, academics, professional organisations and pharmacists a base from which to develop implementation protocols and programs.
- Implementation evidence may help community pharmacy achieve their overall goal of professional service provision and subsequent improvement of health outcomes for the communities they serve.

<sup>1</sup> Houle, S.K., et al. 2014, *Can Pharm J (Ott)*, vol. 147, no. 4, pp. 209-32.<sup>3</sup> Brownson, R., Colditz, G. & Proctor, E. 2012, *Dissemination and Implementation*

<sup>2</sup> Moullin, J.C., et al. *Health Res Policy Syst*, vol. 13, p. 16.

*Research in Health: translating science to practice*, Oxford University Press, NY.

# OBJECTIVES

The thesis covered the synthesis, analysis and progression of knowledge concerning implementation science as well as its contextualisation and application for the implementation of professional services in community internationally. The research conceptualised and defined the process, influences and indicators for the implementation of professional pharmacy services in community pharmacy.

## Specific Objectives

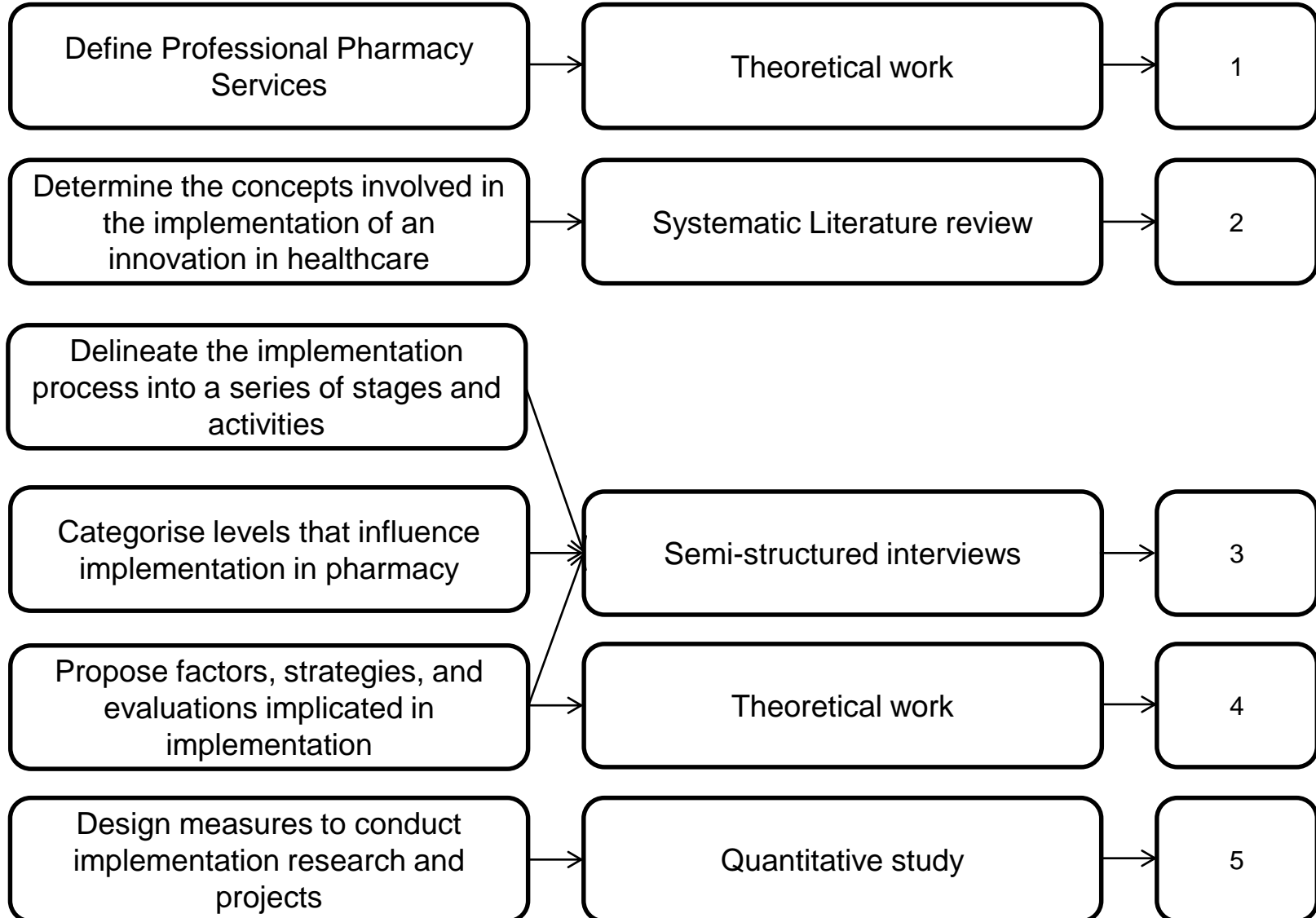
1. Identify the extent to which existing implementation frameworks include implementation concepts and determine if frameworks vary depending on the innovation they target.
2. Explore the implementation process occurring in community pharmacy and to assess the factors, strategies and evaluations influencing this process, in order to tailor a framework for the implementation of services in pharmacy.
3. Develop two tools to measure fidelity, specifically an adherence index and a patient responsiveness scale for medication review with follow-up service.



## Sequence

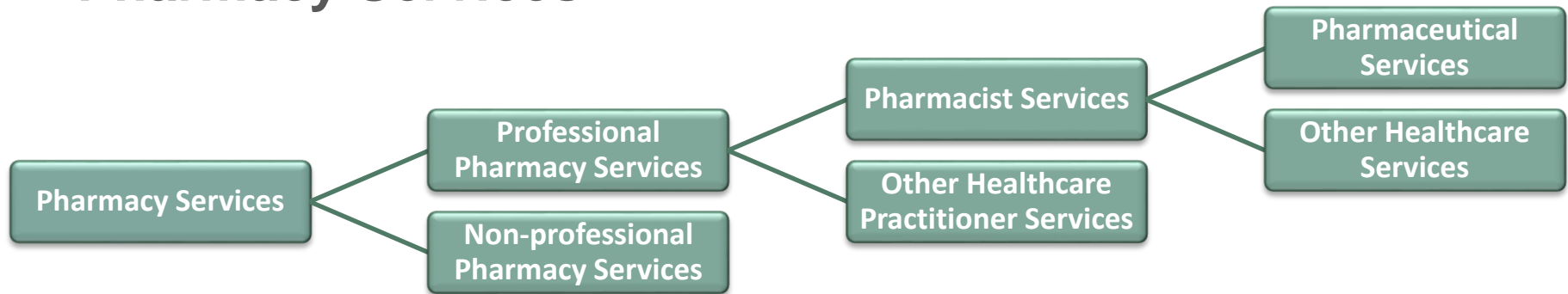
## Methodology

## Article



# RESULTS

## Pharmacy Services



## Professional Pharmacy Service

...is an action or set of actions undertaken in or organised by a pharmacy, delivered by a pharmacist or other health practitioner, who applies their specialised health knowledge personally or via an intermediary, with a patient/client, population or other health professional, to optimise the process of care, with the aim to improve health outcomes and the value of healthcare.

## Sequence

Define Professional Pharmacy Services



## Methodology

Theoretical work

## Article

1



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ScienceDirect

Research in Social and  
Administrative Pharmacy 9 (2013) 989–995

RESEARCH IN SOCIAL &  
ADMINISTRATIVE PHARMACY

Commentary

### Defining professional pharmacy services in community pharmacy

Joanna C. Moullin, B.Pharm.<sup>a,\*</sup>, Daniel Sabater-Hernández, Ph.D.<sup>a,b</sup>,  
Fernando Fernandez-Llimos, Ph.D.<sup>c</sup>, Shalom I. Benrimoj, Ph.D.<sup>a</sup>

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#### Summary

Multiple terms and definitions exist to describe specific aspects of pharmacy practice and service provision, yet none encompass the full range of professional services delivered by community pharmacy. The majority of current pharmacy service definitions and nomenclature refer to either the professional philosophy of pharmaceutical care or to specific professional pharmacy services; particularly pharmaceutical services provided by pharmacists with a focus on drug safety, effectiveness and health outcomes. The objective of this paper is therefore to define a professional pharmacy service within the context of the community pharmacy model of service provision. A *professional pharmacy service* is defined as “an action or set of actions undertaken in or organised by a pharmacy, delivered by a pharmacist or other health practitioner, who applies their specialised health knowledge personally or via an intermediary, with a patient/client, population or other health professional, to optimise the process of care, with the aim to improve health outcomes and the value of healthcare.” Based on Donabedian’s framework, the professional pharmacy service definition incorporates the concepts of organisational structure, process indicators and outcome mea-

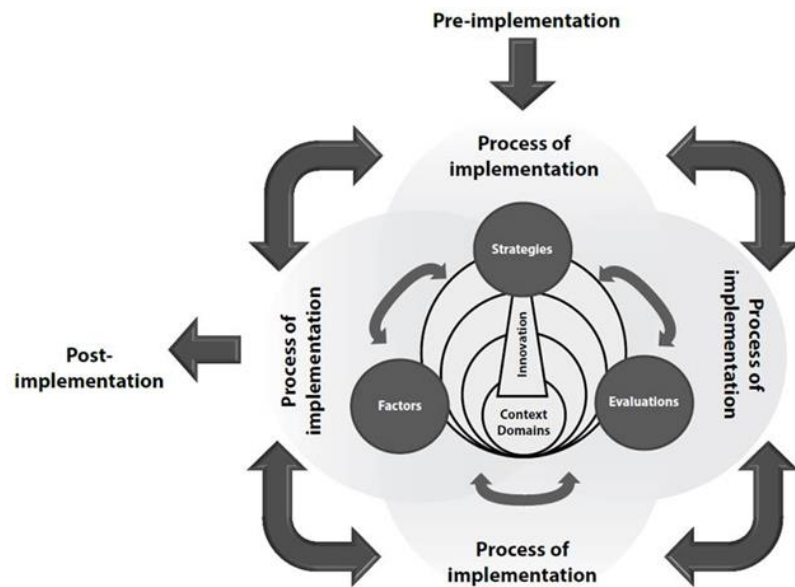
# METHODOLOGY

## **Objetive 1: Identify the extent to which existing implementation frameworks include implementation concepts and determine if frameworks vary depending on the innovation they target**

Systematic literature review to explore implementation science and collate the results as a Generic Implementation Framework

- A systematic search was undertaken in PubMed to identify implementation frameworks of innovations in healthcare published from 2004 (post a comprehensive literature review of implementation studies conducted by Greenhalgh et al (2004)) to May 2013.
- In addition titles and abstracts from *Implementation Science* journal and references from identified papers were reviewed.
- The orientation, type, presence of stages and domains, along with the degree of inclusion and depth of analysis of factors, strategies and evaluations of implementation of included frameworks were analysed.

# RESULTS



- There is variability in the concepts included and the depth of their exploration within implementation frameworks of diverse innovations in healthcare.
- Out of the 49 implementation frameworks only five comprehensively included the range of items within any one element with justification for their inclusion.
- Overall, there was limited degree and depth of analysis of implementation concepts.

## ➤ **Generic Implementation Framework**

# GENERIC IMPLEMENTATION FRAMEWORK (GIF)

## **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).

## Sequence

Determine the concepts involved in the implementation of an innovation in healthcare

## Methodology

Systematic Literature review

## Article

2

Moullin *et al. Health Research Policy and Systems* (2015) 13:16  
DOI 10.1186/s12961-015-0005-z



HEALTH RESEARCH POLICY  
AND SYSTEMS

REVIEW

Open Access

# A systematic review of implementation frameworks of innovations in healthcare and resulting generic implementation framework

Joanna C Moullin<sup>1\*</sup>, Daniel Sabater-Hernández<sup>1,2</sup>, Fernando Fernandez-Llimos<sup>3</sup> and Shalom I Benrimoj<sup>1</sup>

## Abstract

**Background:** Implementation science and knowledge translation have developed across multiple disciplines with the common aim of bringing innovations to practice. Numerous implementation frameworks, models, and theories have been developed to target a diverse array of innovations. As such, it is plausible that not all frameworks include the full range of concepts now thought to be involved in implementation. Users face the decision of selecting a single or combining multiple implementation frameworks. To aid this decision, the aim of this review was to assess the comprehensiveness of existing frameworks.

**Methods:** A systematic search was undertaken in PubMed to identify implementation frameworks of innovations in healthcare published from 2004 to May 2013. Additionally, titles and abstracts from *Implementation Science* journal and references from identified papers were reviewed. The orientation, type, and presence of stages and domains, along with the degree of inclusion and depth of analysis of factors, strategies, and evaluations of implementation of included frameworks were analysed.

**Results:** Frameworks were assessed individually and grouped according to their targeted innovation. Frameworks for particular innovations had similar settings, end-users, and 'type' (descriptive, prescriptive, explanatory, or predictive). On the whole, frameworks were descriptive and explanatory more often than prescriptive and predictive. A small number of the reviewed frameworks covered an implementation concept(s) in detail, however, overall, there was limited degree and depth of analysis of implementation concepts. The core implementation concepts across the frameworks were collated to form a Generic Implementation Framework, which includes the process of implementation (often portrayed as a series of stages and/or steps), the innovation to be implemented,

# METHODOLOGY

**Objective 2: Explore the implementation process occurring in community pharmacy and to assess the factors, strategies and evaluations influencing this process, in order to tailor a framework for the implementation of services in pharmacy**

A qualitative study using semi-structured interviews to examine the process and influences on implementation in community pharmacies in Australia.

- Setting: 21 community pharmacies in Australia
- Population: 25 pharmacists
- Study Design: Semi-structured interviews using an eight question interview guide based on the implementation concepts from the literature review
- Analysis: Framework analysis and thematic analysis of the data

Ethics approval was obtained and all participants signed consent forms. All responses were confidential.



# RESULTS

## Development or Discovery

Trigger



### Exploration

Assess:

- Organisational fit
- Value (relative advantage)
- Service (characteristics)
- Organisational capacity (supporting conditions & staff capacity)
- Community fit

Decision

- Assign leader
- Research requirements
- Organise supporting conditions

- Plan service procedure
- Rearrange workflow
- Staff arrangements
- Team communication (buy-in & foster climate)

- Training
- Community awareness & recruitment

- Initial adaptations
- Familiarisation & improve staff conditions
- Test patient demand

### Testing

### Preparation

### Operation

- Modification of plans & procedures
- Maintain patient demand
- Staffing
- Teamwork, team input, & internal communication
- Integration tactics
- Ongoing training
- Goal setting
- Monitoring
- Adaptation
- Improvement

### Sustainability

- Monitoring\*
- Adaptation\*
- Improvement\*

# RESULTS

## **Influences: Factors, strategies and evaluations**

Service value/relative advantage and characteristics crucial

Five key drivers appeared across all implementation stages, plus the service

- Pharmacy's direction and impetus
- Internal communication
- Staffing
- Community fit
- Support

Seventeen new factors added to CFIR

Strategies varied widely

Evaluations were lacking

# RESULTS

		Stages				
		Exploration	Preparation	Testing	Operation	Sustainability
1	Trigger					
2	Pharmacy direction & impetus					
3	Value & relative advantage					
4	Service characteristics					
5	Supporting conditions					
6	Staff capacity					
7	Community fit					
8	Team input and teamwork					
9	Internal communication					
10	Service procedure					
11	Training					
12	Goal setting					
13	Behavioural regulation					
14	Adaptations					
15	Improvement					
16	Evaluation					

# FRAMEWORKS

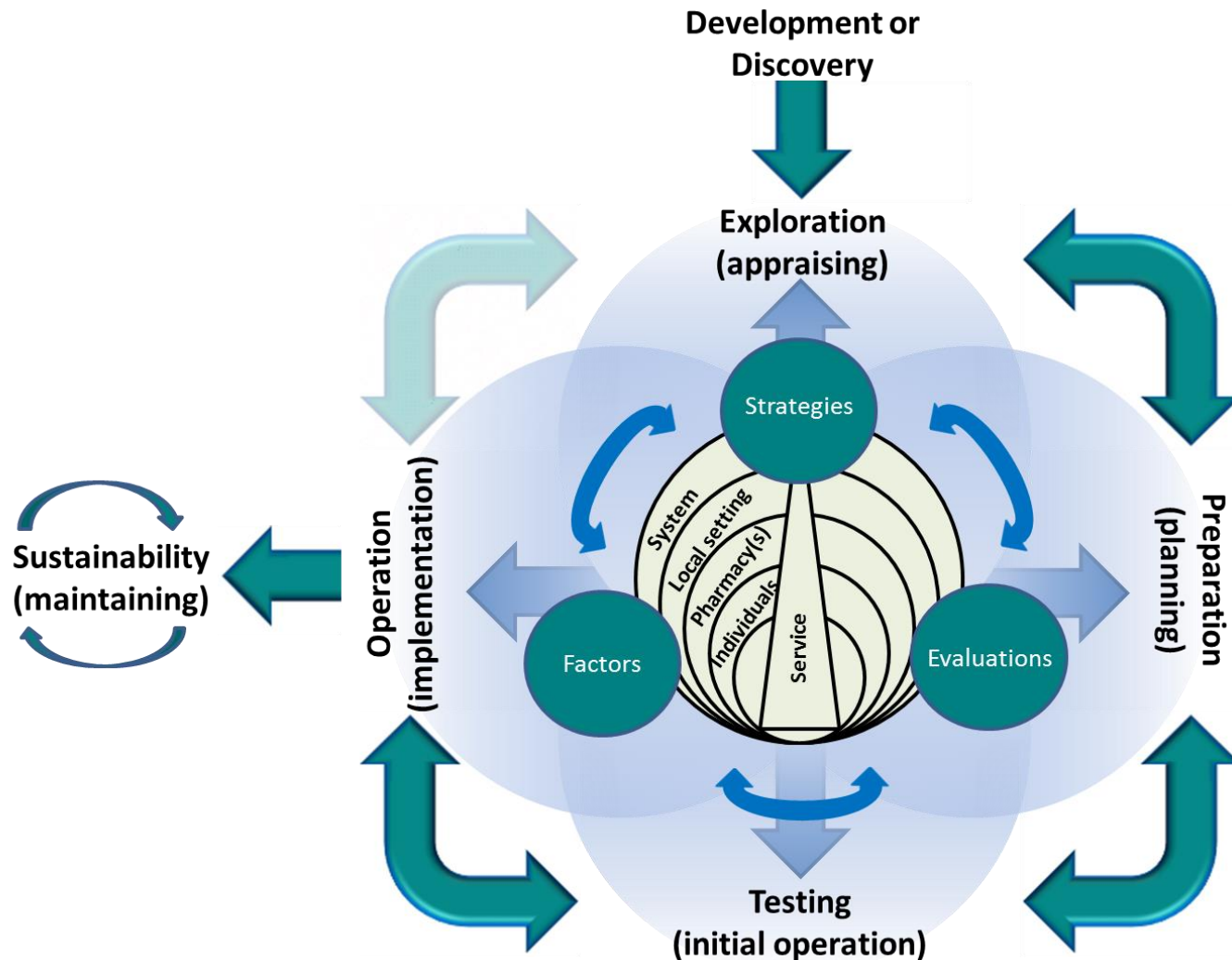
- Active Implementation Frameworks
- Promoting Action on Research Implementation in Health Services (PARIHS)
- Consolidated Framework for Implementation Research (CFIR)
- Theoretical Domains Framework (TDF) & Behaviour Change Wheel (BCW)
- Quality Implementation Framework
- RE-AIM

## ➤ **Generic Implementation Framework**

## ➤ **Framework for the Implementation of Services in Pharmacy**

1. Model of the implementation process in community pharmacy (stages & steps)
2. Contextual ecological levels of influence for community pharmacy
3. Adapted CFIR list of influencing factors for community pharmacy
4. Implementation Strategies
5. *Model for the evaluation of implementation programs and professional pharmacy services*

# FRAMEWORK FOR THE IMPLEMENTATION OF SERVICES IN PHARMACY



## Sequence

Delineate the implementation process into a series of stages and activities

Categorise levels that influence implementation in pharmacy

Propose factors, strategies, and evaluations implicated in implementation

## Methodology

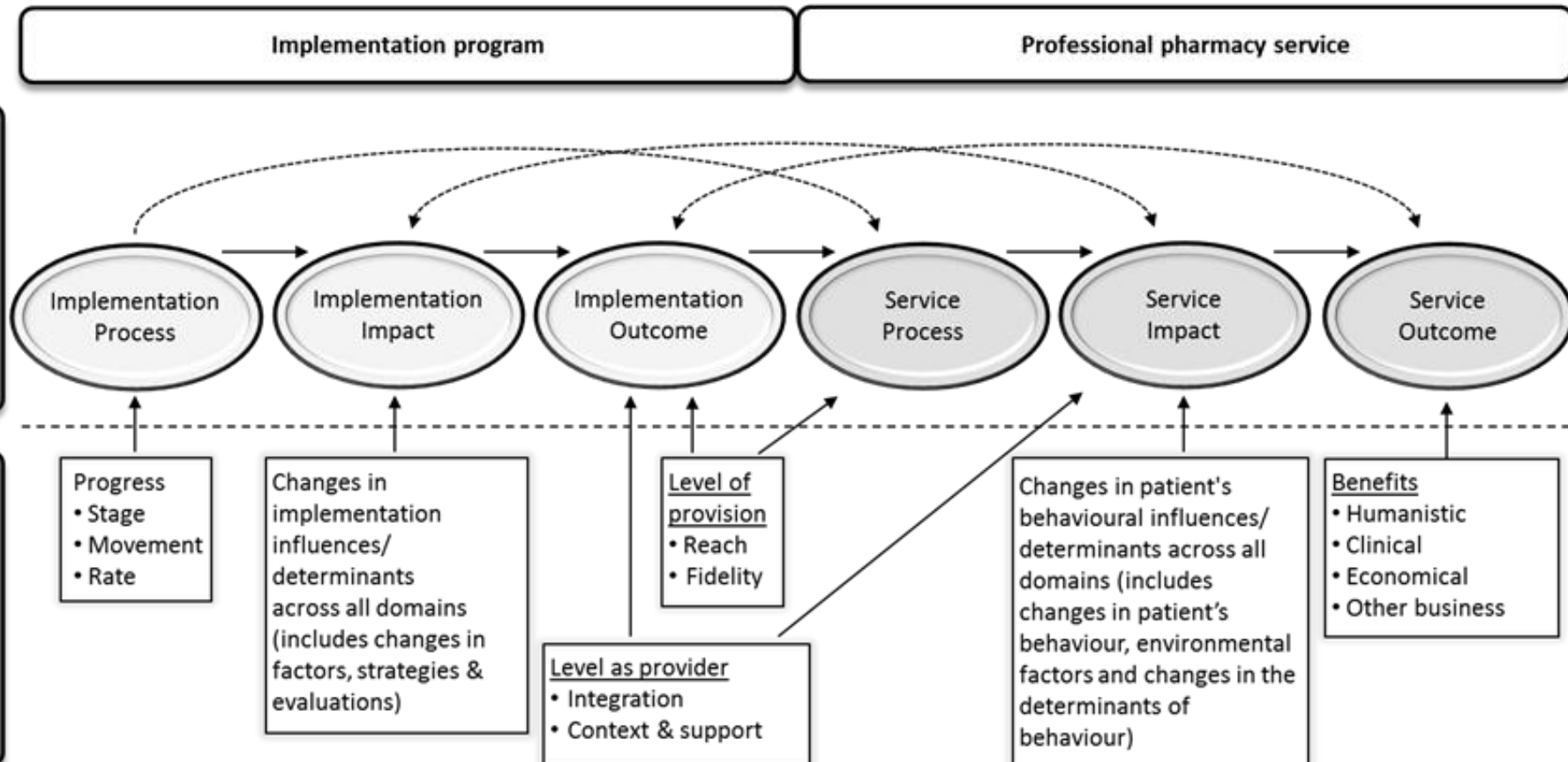
Semi-structured interviews

## Article

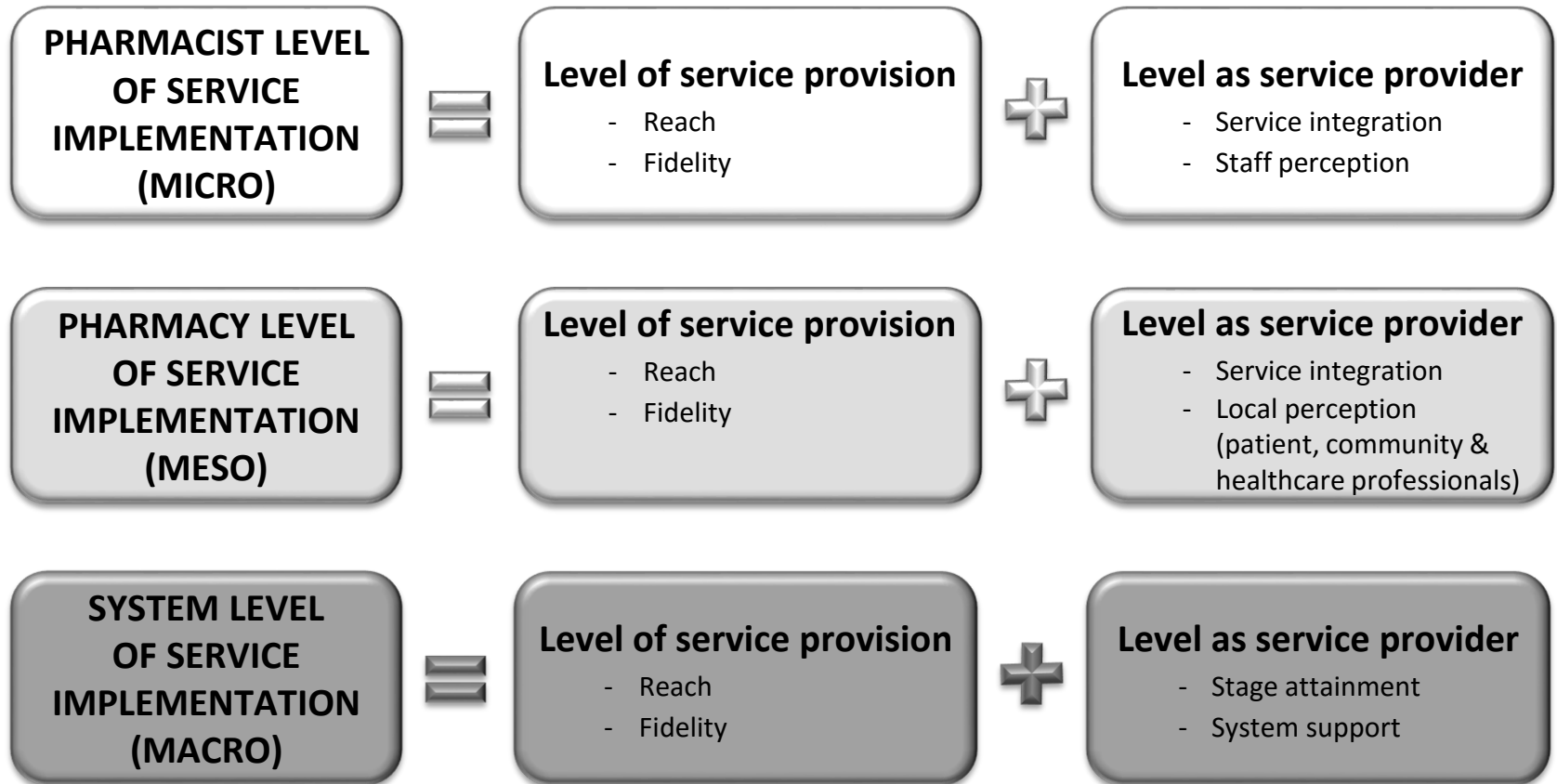
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Results under review

# MODEL FOR THE EVALUATION OF IMPLEMENTATION PROGRAMS AND PHARMACY SERVICES



# LEVEL OF IMPLEMENTATION

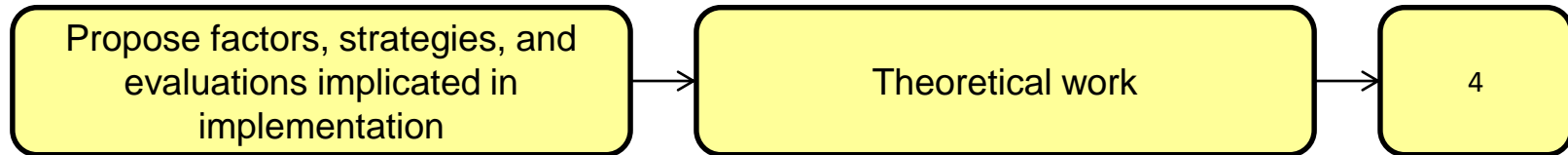




# Sequence

# Methodology

# Article



## ARTICLE IN PRESS



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Research in Social and  
Administrative Pharmacy ■ (2015) ■-■

RESEARCH IN SOCIAL &  
ADMINISTRATIVE PHARMACY

### Commentary

## Model for the evaluation of implementation programs and professional pharmacy services

Joanna C. Moullin, B.Pharm.<sup>a,\*</sup>, Daniel Sabater-Hernández, Ph.D.<sup>a,b</sup>,  
Shalom I. Benrimoj, Ph.D.<sup>a</sup>

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<sup>b</sup>Academic Centre in Pharmaceutical Care, Pharmaceutical Care Research Group, Faculty of Pharmacy, University of Granada, Campus Universitario de Cartuja s/n, C.P. 18071, Granada, Spain

### Summary

Pharmacy practice and pharmaceutical care research of professional services has largely focused on patient outcomes and cost-effectiveness. Research studies have been, for the most part, conducted in controlled conditions prior to full scale implementation. There appears to be a dearth of process and evaluation of implementation reported. Conducting implementation research or adding implementation measures to an impact study, adds external validity to services and patient outcomes. Evaluations are required for all

# METHODOLOGY

**Objective 3: Develop two tools to measure fidelity, specifically an adherence index and a patient responsiveness scale for medication review with follow-up service.**

Mixed methodology study, using both an expert panel followed by statistical analysis, conducted in Spain, to develop two questionnaires and test their reliability and validity as measures of the implementation outcome, fidelity.

- Expert panel used to establish content validity of both tools
- Initial item functioning for both tools was conducted using descriptive statistics and item discrimination
- Cronbach's alpha and inter-item for reliability of the scale
- Exploratory Factor Analysis (EFA) to test construct validity of the scale

Ethics approval was obtained and all participants signed consent forms. All responses were confidential.

# RESULTS

## Fidelity

<b>Conceptual variable</b>	<b>Operational definition</b>
<b>Adherence</b> (6-8, 19, 20)	Process: The extent service delivery is consistent with the designed service process and protocol.
	Structure: The extent to which the environmental aspects and foundation from which the service is delivered are implemented.
<b>Dose</b> (6-8, 19, 20)	The amount (intensity), frequency and duration of service components and phases.
<b>Patient responsiveness</b> (7, 19, 20)	Degree of patient participation and enthusiasm to aspects of the service protocol that require their involvement.
<b>Adaptation*</b> (6, 19)	Unintentional drift or intended changes made to the components of the service
<b>Quality*</b> (6-8, 19, 20)	The manner in which the service is delivered towards the theoretical ideal. Dimensions may include provider enthusiasm, facilitation of responsiveness, preparation, knowledge and confidence/self-efficacy.
<b>Differentiation*</b> (6-8, 19, 20)	Degree to which the critical components are present including comparing what patients receive with the service to what they receive with normal practice.

\* *Conceptual variables that may not be considered dimensions of fidelity, but as moderators. They should be measured, but may or may not be included in fidelity measurement itself (8)*

## - FIDELITY -

### PATIENT RESPONSIVENESS SCALE

- Degree patients respond to aspects of the service protocol that require their involvement.
- Item pool was built
- 5-point Likert scale to indicate the frequency

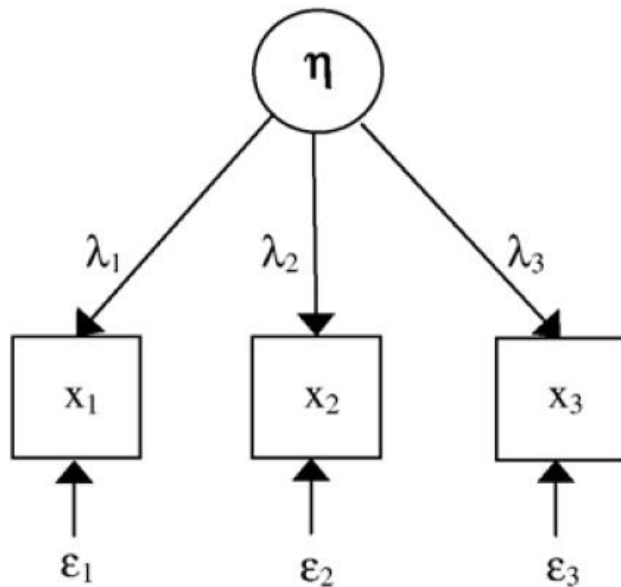
### ADHERENCE INDEX

- Measure the adherence to the process aspects of all phases of the service
- Items for each phase were delineated considering the definition and objectives of the service
- 5-point Likert scale to indicate the frequency

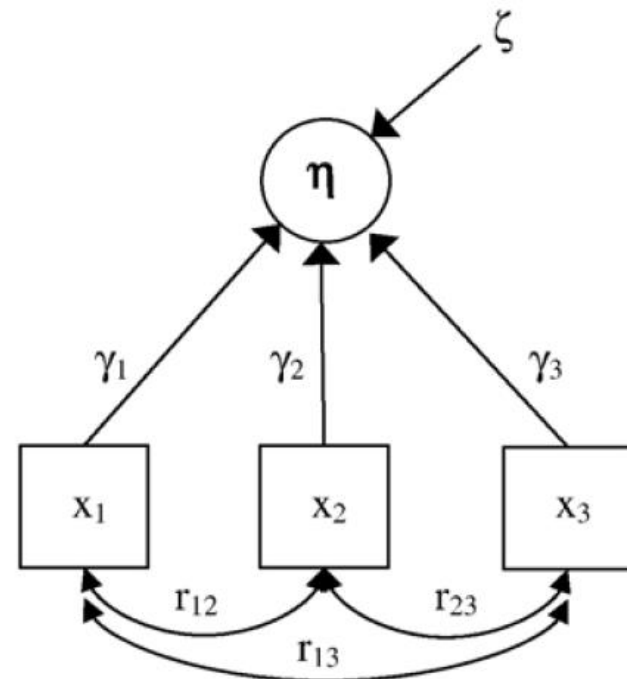
- 1) Define the latent variable**
- 2) Generate indicators/items**
- 3) Determine format for measurement**
- 4) Expert review of items**
- 5) Administer to sample**
- 6) Evaluate items**
- 7) Optimise length**

# - FIDELITY -

## PATIENT RESPONSIVENESS SCALE



## ADHERENCE INDEX



## - FIDELITY -

### PATIENT RESPONSIVENESS SCALE

- Content validated and acceptability high
- Reliability and construct validity tested
- Two factor solution
- 4 items removed after 5 EFA iterations
- Participation (9 items) & enthusiasm (3 items)

### ADHERENCE INDEX

- Content validated and acceptability high
- Low discrimination. Response format changed
- Innovation specific until core components are compared across innovations
- Indicator collinearity and external validity testing is required

**1) Define the latent variable**

**2) Generate indicators/items**

**3) Determine format for measurement**

**4) Expert review of items**

**5) Administer to sample**

**6) Evaluate items**

**7) Optimise length**

# - FIDELITY -

## PATIENT RESPONSIVENESS SCALE

		Nunca [1]	Casi nunca [2]	A veces [3]	A menudo [4]	Siempre [5]
1	Los pacientes demandan el servicio.					
2	Los pacientes aceptan recibir el servicio.					
3	Los pacientes responden a las preguntas del farmacéutico.					
4	Los pacientes toman la iniciativa de formular preguntas al farmacéutico.					
5	Los pacientes aportan información sobre todos los medicamentos que utilizan (ej. botiquín con medicamentos, hoja de tratamientos actual, etc.).					
6	Los pacientes aportan parámetros clínicos recientes (ej. cifras de presión arterial, analíticas) e informes médicos sobre sus problemas de salud (ej. diagnósticos médicos).					
7	Los pacientes participan activamente durante los encuentros con el farmacéutico.					
8	Los pacientes colaboran en la realización del plan de acción y en la priorización de las intervenciones					
9	Los pacientes manifiestan abiertamente sus preocupaciones respecto a sus problemas de salud y tratamientos farmacológicos.					
10	Los pacientes cumplen con las intervenciones propuestas por el farmacéutico.					
11	Cuando las intervenciones están orientadas a cambiar la estrategia farmacológica (dosis, pauta, cambio de medicamentos, etc.) los pacientes cumplen con ellas					
12	Cuando se realiza educación al paciente (ej. uso de los medicamentos, promoción de la adherencia, medidas no farmacológicas), los pacientes cumplen las intervenciones.					
13	Los pacientes acuden al médico cuando el farmacéutico los deriva.					
14	Los pacientes mantienen al farmacéutico informado de cualquier cambio en su medicación y/o en su estado de salud.					
15	Durante el servicio, los pacientes acuden a las citas programadas por el farmacéutico.					
16	A través de otras personas (familiares, amigos de los pacientes) puedo darme cuenta de que los pacientes hablan positivamente del servicio.					

## ADHERENCE INDEX

<b>OFERTA DEL SERVICIO</b>												
1	Se identifican los pacientes que pueden beneficiarse del servicio.	0	1	2	3	4	5	6	7	8	9	10
2	Se oferta el servicio a los pacientes que pueden beneficiarse del servicio.	0	1	2	3	4	5	6	7	8	9	10
3	Se acuerda la cita para la primera entrevista con los pacientes.	0	1	2	3	4	5	6	7	8	9	10
4	Se solicita a los pacientes que traigan a la primera entrevista todos los medicamentos que tienen en casa.	0	1	2	3	4	5	6	7	8	9	10
5	Se solicita a los pacientes que traigan a la primera entrevista los informes médicos que posean.	0	1	2	3	4	5	6	7	8	9	10
6	Se solicita a los pacientes que traigan a la primera entrevista los parámetros que posea.	0	1	2	3	4	5	6	7	8	9	10
<b>PRIMERA ENTREVISTA</b>												
7	Se identifican todos los problemas de salud del paciente.	0	1	2	3	4	5	6	7	8	9	10
8	Se recaba información sobre el grado de control de los problemas de salud identificados.	0	1	2	3	4	5	6	7	8	9	10
9	Se solicita información adicional (diagnósticos, parámetros clínicos, etc.) cuando es necesario para identificar y/o conocer el control los problemas de salud de mejor forma.	0	1	2	3	4	5	6	7	8	9	10
10	Se registran todos los medicamentos de prescripción médica que utiliza el paciente.	0	1	2	3	4	5	6	7	8	9	10
11	Se registran todos los medicamentos de indicación farmacéutico o automedicación que utiliza el paciente.	0	1	2	3	4	5	6	7	8	9	10
12	Se recaba información sobre el uso que hacen los pacientes de sus medicamentos (dosis, indicaciones, pauta, adherencia, forma de administración etc.).	0	1	2	3	4	5	6	7	8	9	10

# - FIDELITY -

## PATIENT RESPONSIVENESS SCALE

		Never [1]	Rarely [2]	Sometimes [3]	Often [4]	Always [5]
1	Patients request the service.					
2	Patients take the initiative to ask the pharmacist questions.					
3	Patients provide information about all the medicines they use.					
4	Patients actively participate in the encounters with the pharmacist.					
5	Patients collaborate in deciding upon and implementing an action plan.					
6	Patients comply with the interventions proposed by the pharmacist.					
7	Patients adhere to changes in the medication regimen (change in medication, dose, schedule etc.)					
8	Patients adhere to educational interventions (e.g. use of medications, adherence, non-pharmacological advice etc.)					
9	Patients go to the doctor when the pharmacist recommends them to do so.					
10	Patients keep the pharmacist informed of any changes in medication or health status.					
11	Patients come to appointments scheduled by the pharmacist.					
12	Patients' family and friends talk about the benefits of the service.					



## Sequence

Design measures to conduct  
implementation research and  
projects



## Methodology

Quantitative study



## Article

5

Accepted and Forthcoming  
J Eval Clin Pract

# RESEARCH DISSEMINATION SUMMARY

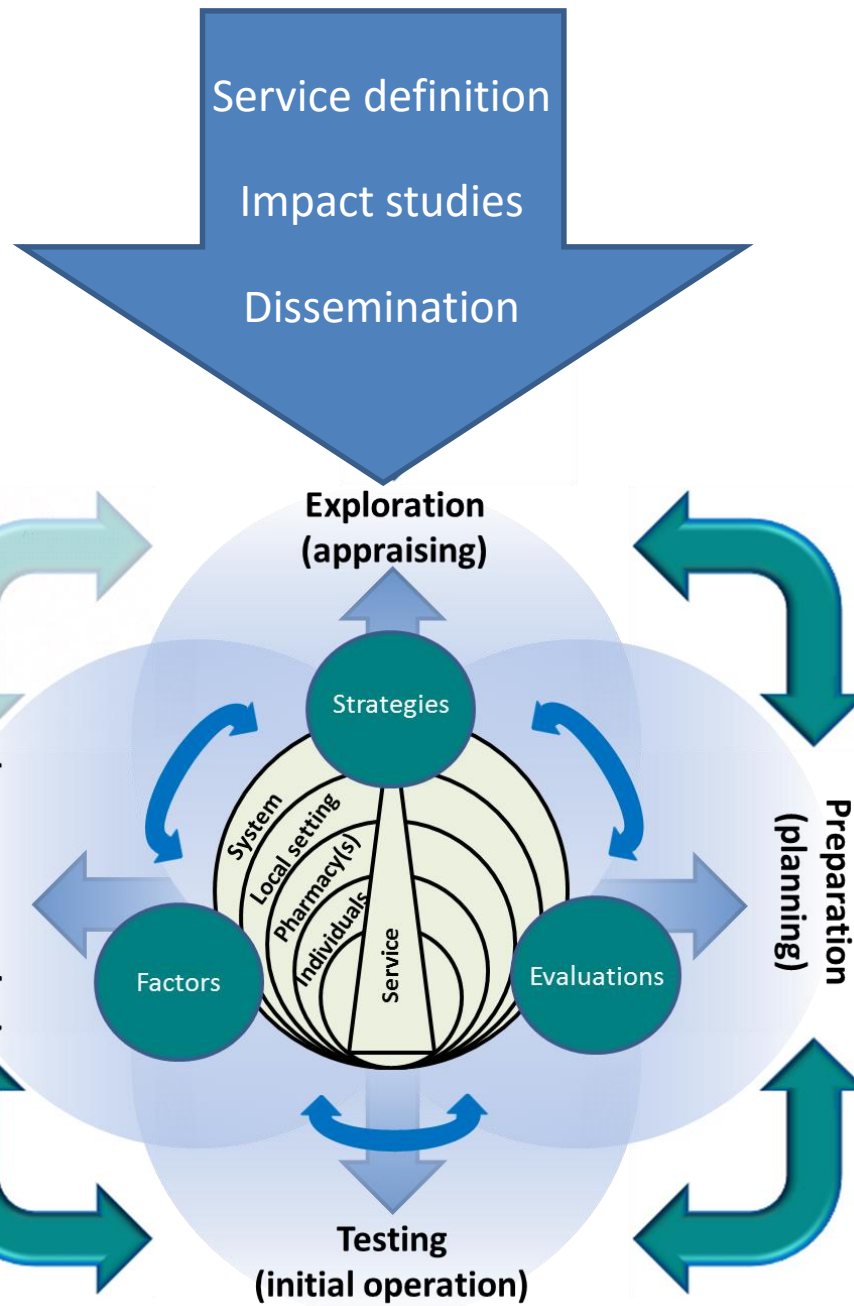
## Peer Reviewed Publications

- 2015 Moullin JC et al. Model for evaluation of implementation programs and professional pharmacy services. *Res Social Adm Pharm*. Epub 2015 Aug 15.
- 2015 Moullin JC et al. Development and testing of two implementation tools to measure components of professional pharmacy service fidelity. *J Eval Clin Pract*. Forthcoming 2015.
- 2015 Moullin JC et al. Qualitative study on the implementation of professional pharmacy services in community pharmacy using framework analysis. (results under review)
- 2015 Moullin JC et al. A systematic review of implementation frameworks of innovations in healthcare and resulting generic implementation framework. *Health Res Policy Syst* 2015; 13:16.
- 2013 Moullin JC et al. Defining Professional Pharmacy Services in Community Pharmacy. *Res Social Adm Pharm* 2013; 9(6): 989-995.

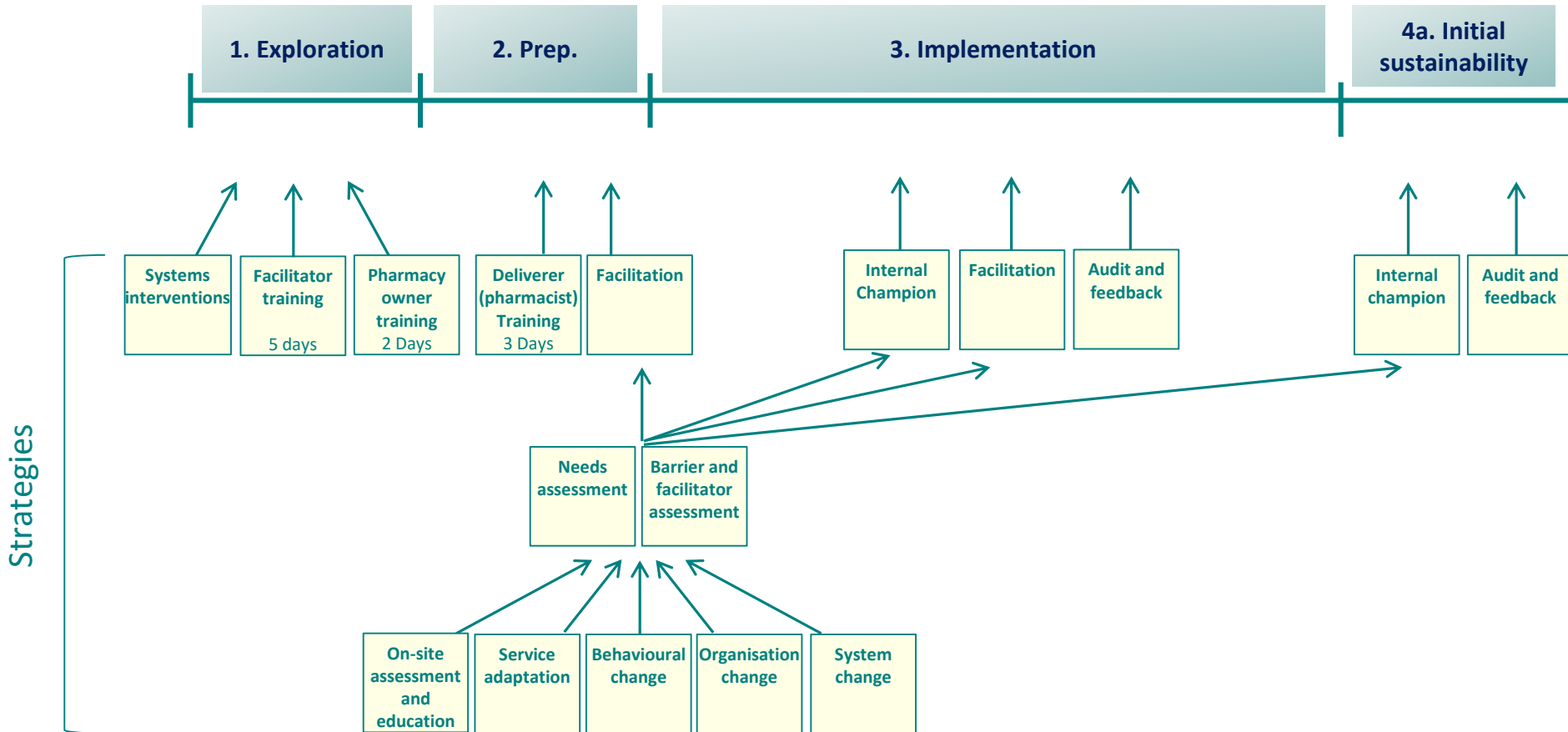
# APPLICATION

- Health Destination Pharmacy
- AIM-HIGH (adherence program for banner group of pharmacies)
- conSIGUE (medication review with follow-up in Spain)
- Asthma program

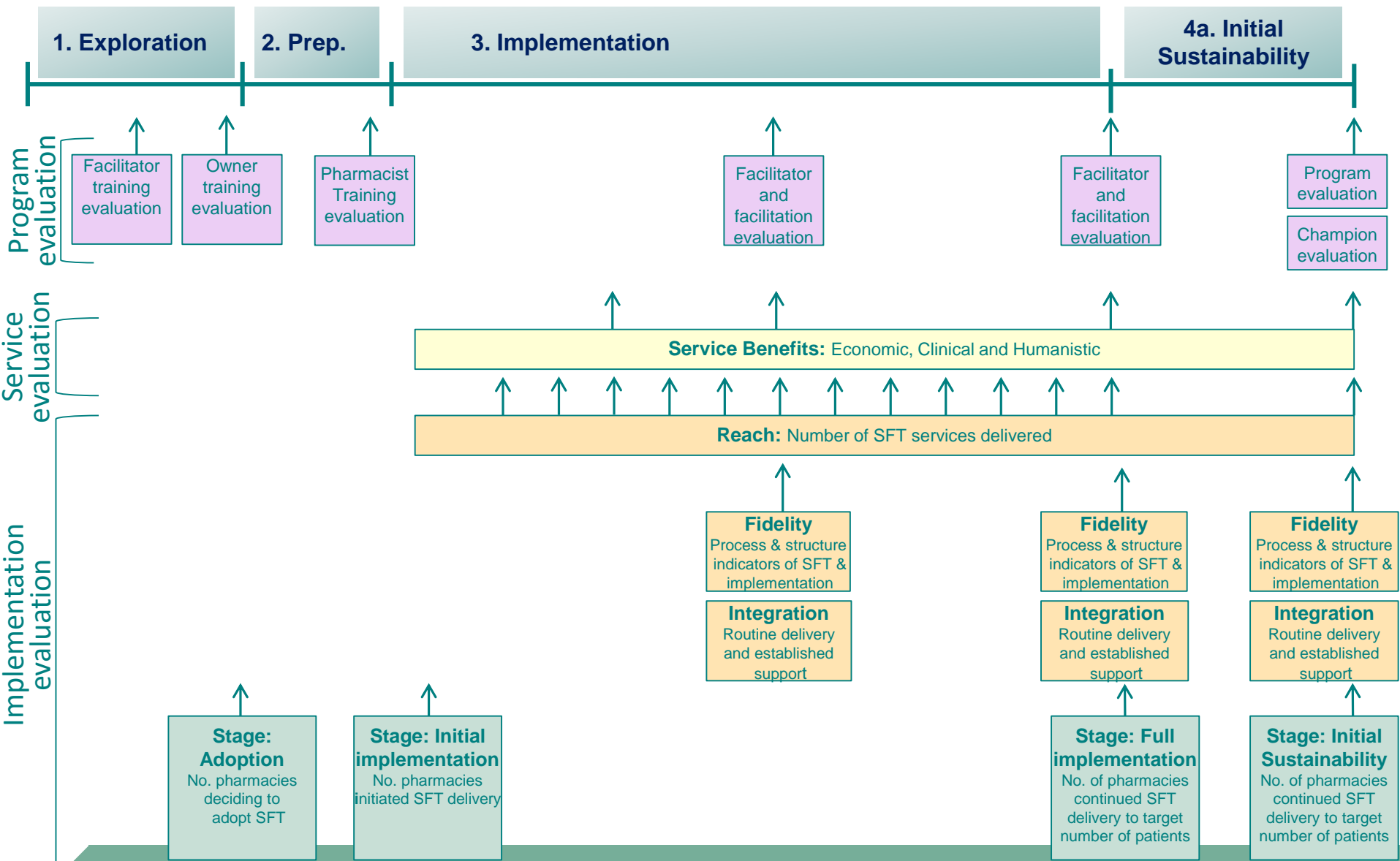
# conSIGUE



# Strategies



# Evaluations





**THANK YOU**

**[jcmoullin@gmail.com](mailto:jcmoullin@gmail.com)**