



# **Appropriate and inappropriate polypharmacy-choosing the right strategy**

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# Use of medicines: a common intervention

***“The use of medications in older patients is arguably the single most important health care intervention in the industrialized world.”***

***Avorn, JAMA 2010; 304: 1606-1607***

# Guidance on prescribing



# Changing perspectives-the time span

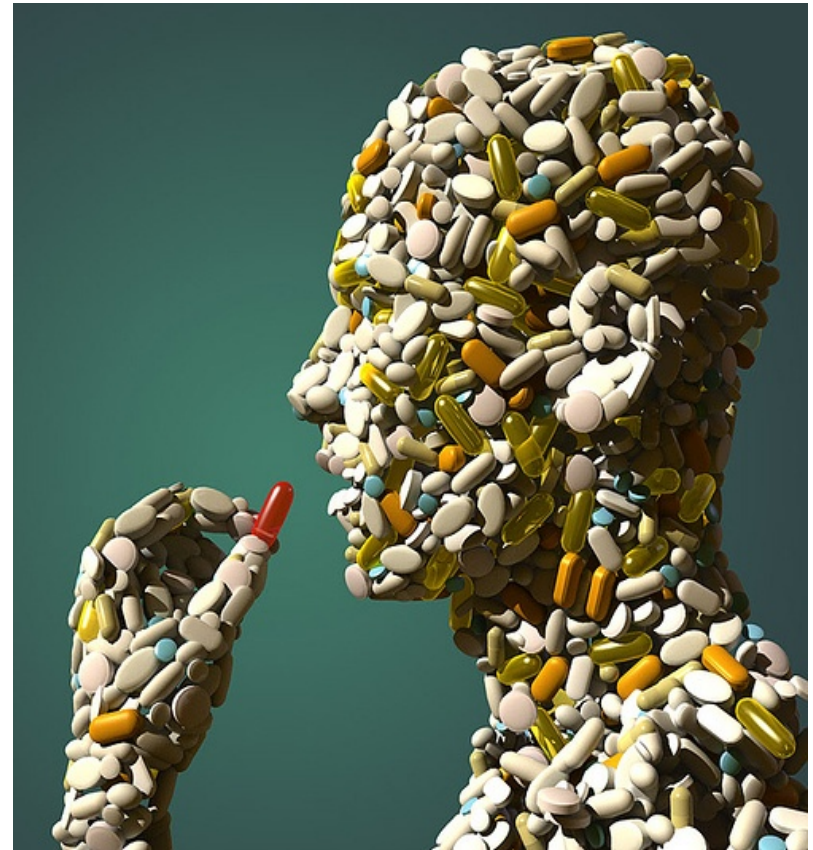
A great deal of treatment that is given to the young and middle aged is intended to prevent troubles in the distant future and some nuisance on the present may be accepted to obtain this end. The rigid control of hypertension and diabetes are examples. It is, of course, obvious that **old people have no distant future**, yet they are often continued on treatment which, however correct, it might have been, can no longer benefit them.

# Changing perspectives-the patient's capacity

Most elderly patients have **poor memories and get confused**. They may live alone or with a partner **who is no better**. They find it difficult to follow even **simple instructions**, and the complicated schedule sometimes offered, with many drugs to be taken at different times. They are **creatures of habit** and once they have been on tablets for a long time, it may be difficult or unkind to stop them

# Challenges and changing perspectives

- **Challenges of medication use in older people**
  - Altered pharmacokinetics/  
pharmacodynamics
  - Multimorbidity
  - Polypharmacy
- **Changing perspectives on polypharmacy**
  - Numbers?
  - Definitions?



# Going beyond the numbers

EDITORIAL

## Polypharmacy

*A New Paradigm for Quality Drug Therapy in the Elderly?*

- ***“The larger number of **pharmaceuticals** will always be an **important component** of the medical care of **older Americans**.”***

*Gurwitz. Arch Intern Med 2004; 164: 1957-59*

CURRENT OPINION

## Appropriate Polypharmacy and Medicine Safety: When Many is not Too Many

Cathal A. Cadogan<sup>1,2</sup> · Cristin Ryan<sup>1,2</sup> · Carmel M. Hughes<sup>1</sup>

***“The concept of ‘**appropriate polypharmacy**’ recognises that patients can benefit from multiple medications...”***

*Cadogan et al., Drug Safety, 2016; 39: 109-116*

**Getting the balance right between ‘many’ and ‘too many’ drugs**

# Going beyond the numbers *cont'd*

## Commentary

### Going beyond the numbers – a call to redefine polypharmacy

Carmel M. Hughes,<sup>1,2</sup> Janine A. Cooper<sup>1,2</sup> & Cristin Ryan<sup>1</sup>

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# Making the case

Is polypharmacy always hazardous? A retrospective cohort analysis using linked electronic health records from primary and secondary care

Rupert A. Payne,<sup>1</sup> Gary A. Abel,<sup>1</sup> Anthony J. Avery,<sup>2</sup>  
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- Key finding

**Appropriate management with several medicines prevented unplanned admissions**

- Key conclusion

*‘Assumptions that polypharmacy is always unsafe or harmful and that it is indicative of suboptimal care need to be reconsidered in the clinical context of the conditions for which those drugs are being prescribed’*

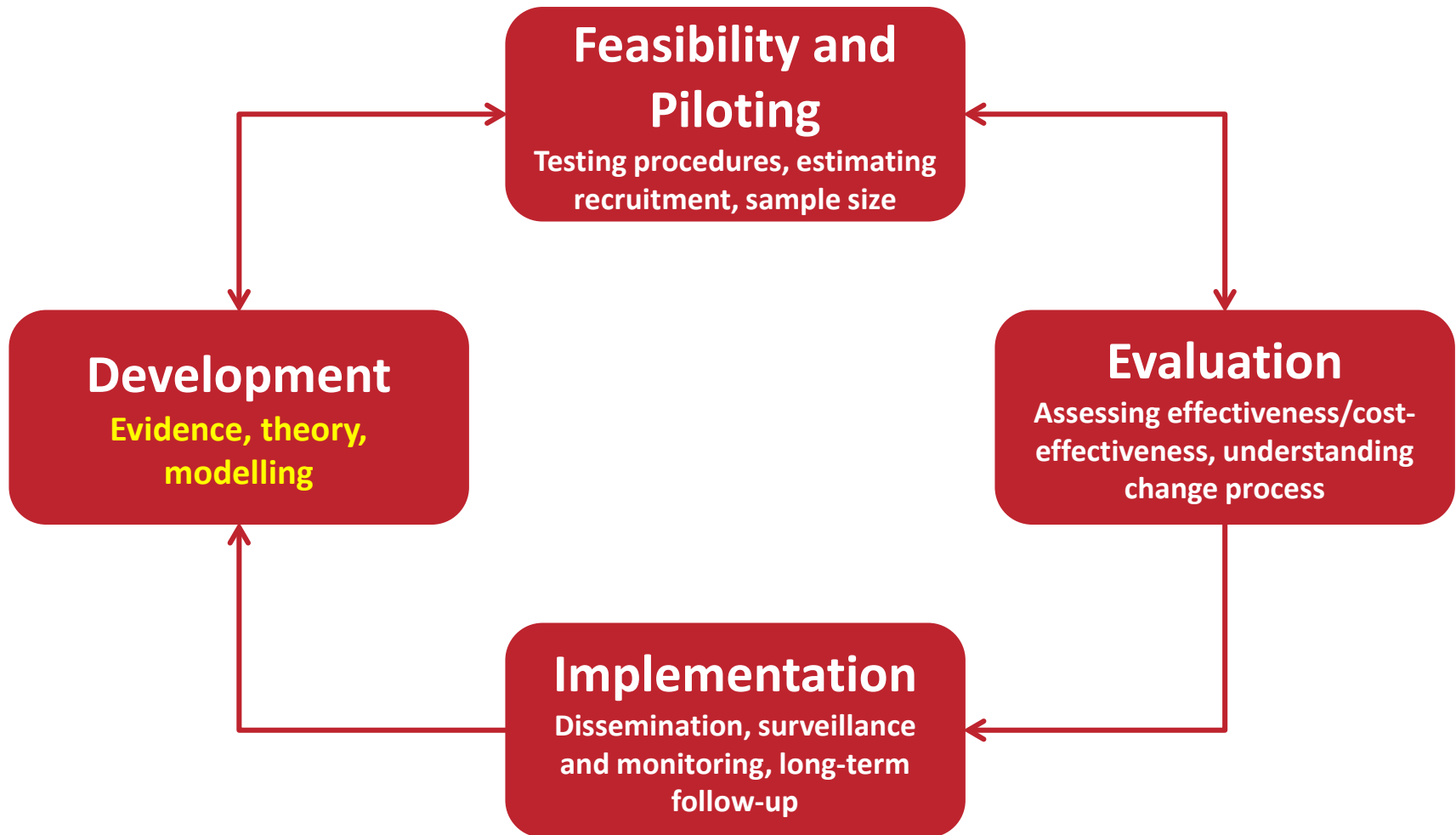
# ***How do we move beyond the numbers to attain appropriate polypharmacy?***

**What's the right strategy?**

**An intervention to improve prescribing of appropriate polypharmacy**

Focusing on **behaviour change**

# Medical Research Council Framework



# Underpinning evidence



Interventions to improve the appropriate use of polypharmacy for older people (Review)

Rankin A, Cadogan CA, Patterson SM, Kerse N, Cardwell CR, Bradley MC, Ryan C, Hughes C

- Intervention development lacked detailed description
- Evidence for effectiveness of identified interventions was weak

# Approach to developing interventions

## Series of systematic steps focusing on behaviour change

1. Specify target behaviour(s)-what needs to change  
Prescribing of polypharmacy
2. Identify barriers to/facilitators of behaviour change
3. Consider how to change the target behaviour(s)
4. Implement an intervention that seeks to change the target behaviour(s)
5. Evaluate

# Identification of barriers and facilitators- Theoretical Domains Framework (TDF)

12 theoretical domains relevant to changing healthcare professionals' behaviour.

Theoretical domains	
Knowledge	Skills
Beliefs about capabilities	Emotion
Beliefs about consequences	Behavioural regulation
Motivation and goals	Social influences
Memory, attention and decision processes	Environmental context and resources
Social/professional role and identity	Nature of the behaviours

# TDF-based interviews

- Interview guides developed based around the domains
  - Interviewed GPs about appropriate polypharmacy
  - Identified domains which are perceived to act as barriers to, and facilitators of, behaviour change
- Used to guide intervention design, based on changing **target behaviour(s)**

# Sample interview questions

## GPs

### **Knowledge**

*“What knowledge do you have as a GP that would help you to make the necessary changes to ensure that patients receive appropriate polypharmacy as opposed to inappropriate polypharmacy?”*

### **Social/professional role and identity**

*“What would you consider your responsibilities to be as a GP in ensuring that older patients receive appropriate polypharmacy?”*



# Key domains for prescribing appropriate polypharmacy

- **Prescribing**
  - Skills
  - Beliefs about capabilities
  - Beliefs about consequences
  - Environmental context and resources
  - Memory, attention and decision processes
  - Social/professional role
  - Social influences
  - Behavioural regulation

# Changing behaviour

- Target key **domains** as part of intervention using established **behaviour change techniques (BCTs)**
  - Can map from TDF domains to appropriate BCTs
- *“An observable, replicable and irreducible component of an intervention designed to alter or redirect causal processes that regulate behaviour”*
- BCTs are the basis of the intervention
  - **‘Active ingredients’**

# Examples of BCTs

BCT	Definition	Example
Goal-setting	Set or agree a goal defined in terms of the behaviour to be achieved	Set a goal with patients of taking all medicines as prescribed
Prompts and cues	Introduce or define environmental or social stimulus with the purpose of prompting or cueing the behaviour. The prompt or cue would normally occur at the time or place of performance	Place a Post-it® note on the door to remind patients to take medicines before leaving the house in the morning
Self-monitoring	Instruct self-recording of specified behaviour	Request patients to note each time they take their medicines in a diary

# Mapping TDF domains to BCTs

TDF	BCT
Skills	Behavioural rehearsal/practice
Beliefs about consequences	Self-monitoring
Environmental context and resources	Prompts and cues

# BCTs embedded in the intervention

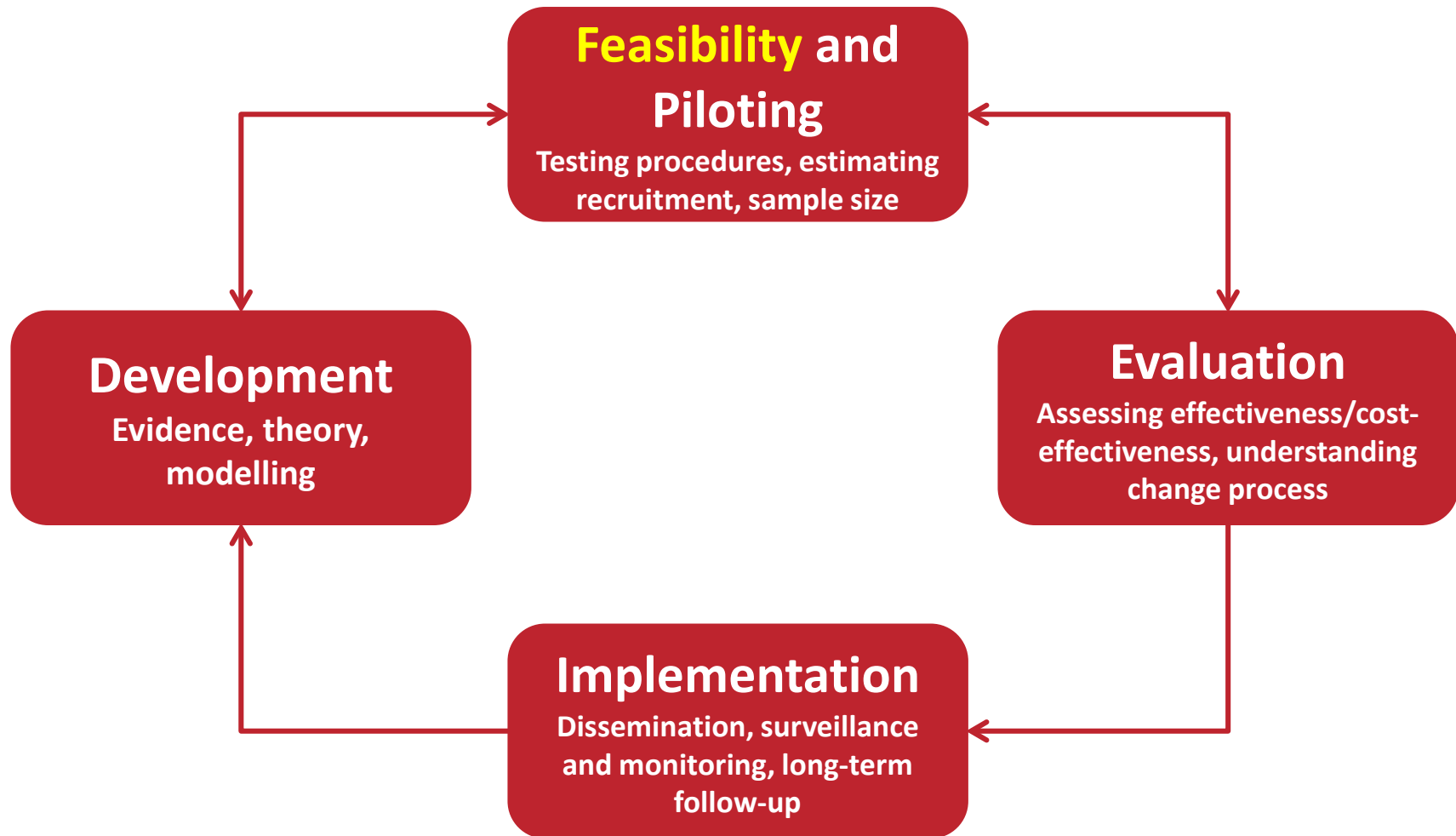
Behaviour change technique	Example of how the behaviour change technique is being operationalised as part of the intervention
Action planning	GPs will plan to perform medication reviews on the specified date when patients meeting inclusion criteria present at the practice for a scheduled appointment
Prompts/cues	GPs will be prompted by the receptionist/practice manager to perform medication reviews with older patients meeting inclusion criteria when patients present for a scheduled appointment
Modelling or demonstrating of behaviour	GPs will be provided with a video demonstration of how to perform a medication review with an older patient who is receiving polypharmacy
Salience of consequences	As part of the video demonstration of how to perform a medication review, feedback will be included from the GP and 'patient' to emphasise the potentially positive consequences of performing the review

# Intervention components



1. A **video** demonstrating how general practitioners (GPs) can prescribe appropriate polypharmacy during a typical consultation with an older patient
2. A **patient recall** process (appointment with GP for a medication review)
3. GPs making **explicit plans** how to ensure target patients were prescribed appropriate polypharmacy
4. GPs receiving **prompts** from reception staff to carry out this plan when target patients arrived at the practice

# Medical Research Council Framework



# Feasibility study

- Four GPs and ten patients were recruited from two practices in Northern Ireland
- The intervention was considered usable and acceptable by GPs
- Patients welcomed the opportunity to have their medications reviewed
- Patient feedback was positive

Cadogan et al. *Pilot and Feasibility Studies* (2018) 4:23  
DOI 10.1186/s40814-017-0166-3

Pilot and Feasibility Studies

RESEARCH

Open Access



A feasibility study of a theory-based intervention to improve appropriate polypharmacy for older people in primary care

Cathal A. Cadogan<sup>1</sup>, Cristin Ryan<sup>1</sup>, Gerard J. Gormley<sup>2</sup>, Jill J. Francis<sup>3</sup>, Peter Passmore<sup>4</sup>, Ngaire Kerse<sup>5</sup> and Carmel M. Hughes<sup>6\*</sup>

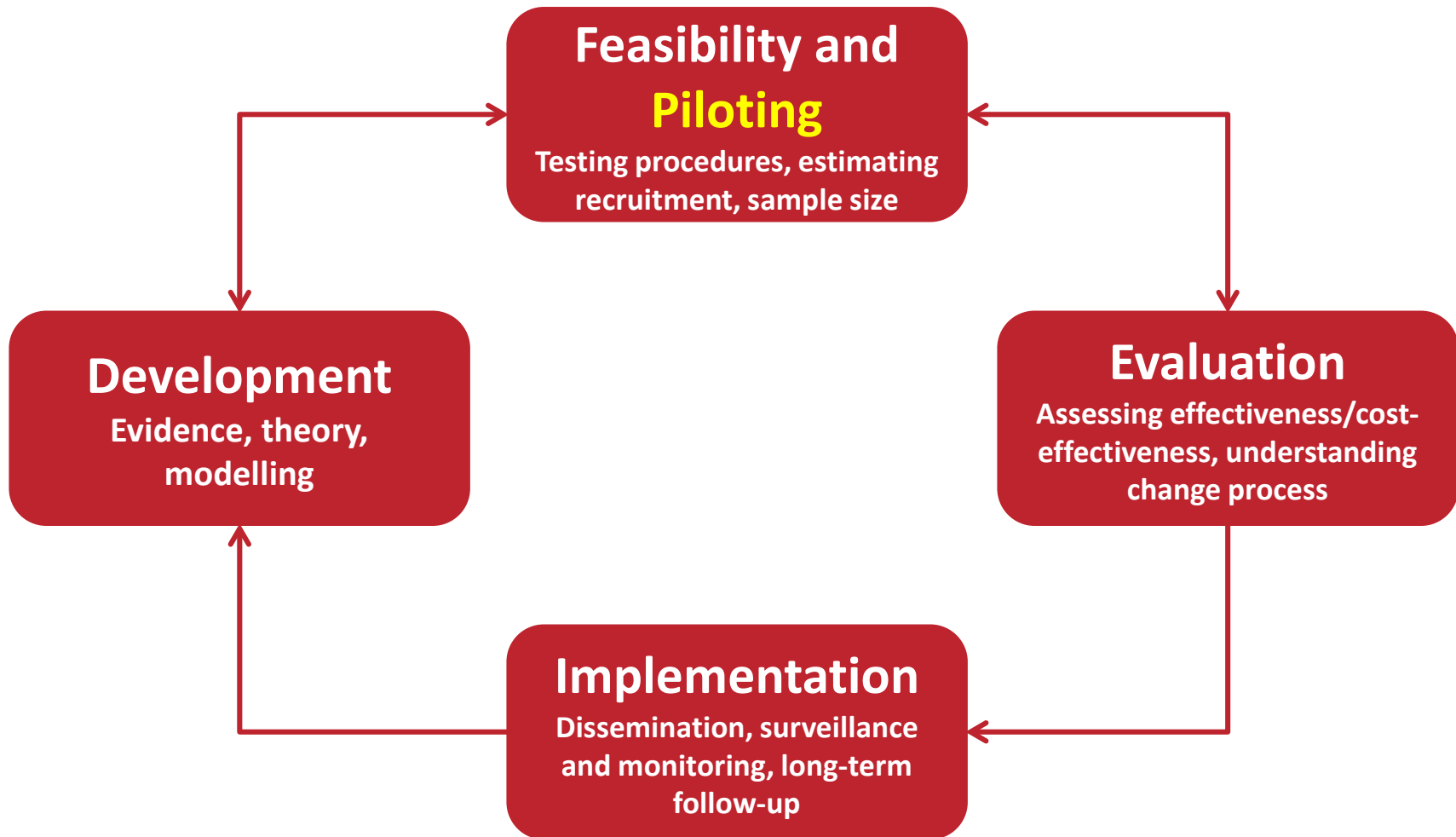
## Abstract

**Background:** A general practitioner (GP)-targeted intervention aimed at improving the prescribing of appropriate polypharmacy for older people was previously developed using a systematic, theory-based approach based on the UK Medical Research Council's complex intervention framework. The primary intervention component comprised a video demonstration of a GP prescribing appropriate polypharmacy during a consultation with an older patient. The video was delivered to GPs online and included feedback emphasising the positive outcomes of performing the behaviour. As a complementary intervention component, patients were invited to scheduled medication review consultations with GPs. This study aimed to test the feasibility of the intervention and study procedures (recruitment, data collection).

**Methods:** GPs from two general practices were given access to the video, and reception staff scheduled consultations with older patients receiving polypharmacy (≥4 medicines). Primary feasibility study outcomes were the usability and acceptability of the intervention to GPs. Feedback was collected from GP and patient participants using



# Medical Research Council Framework



# PolyPrime

- A randomised pilot study of a theory-based intervention to improve appropriate polypharmacy in older people in primary care
- Funded under the CHITIN initiative:  
**Cross-border Healthcare Intervention Trials in Ireland Network**

# Aim

- To undertake a pilot cluster RCT (cRCT) of a theory-based intervention targeting prescribing of appropriate polypharmacy in primary care (PolyPrime) to assess the feasibility of a definitive cRCT of the PolyPrime intervention

# The Defined Area

- PolyPrime will operate within a clearly defined area including Northern Ireland and the border region of Ireland

## Northern Ireland:

Antrim	Armagh
Down	Fermanagh
Londonderry/Derry	Tyrone

## Republic of Ireland:

Cavan	Donegal
Leitrim	Louth
Monaghan	Sligo



# Overview of PolyPrime

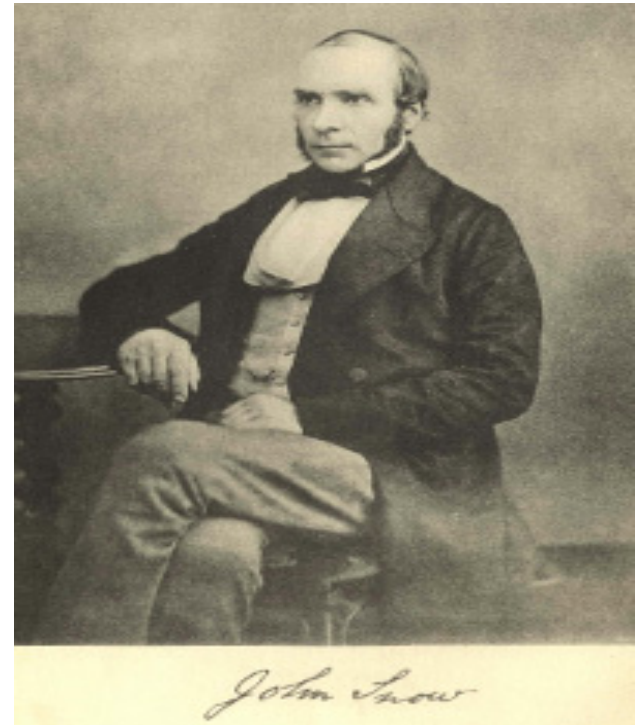
- 12 GP practices recruited from the Defined Area
  - 10 patients per practice recruited
  - Practices randomised to intervention or control
- Video will be made available to intervention practices on a secure platform
- Eligible patients invited to attend the practice on two occasions for review
- Data collection at baseline, 6 and 12 months
  - Medication appropriateness, health-related quality of life and cost analysis
  - Process evaluation

# Reflections on this strategy

- **A systematic approach to intervention development**
- **Detailed, thorough, exhaustive**
- **Time-consuming**
  - Balance between rigour and practical approach
- **Important question**
  - Will this strategy lead to a more effective intervention?

# Developing a strategy to reduce harm

- John Snow 1813-1858
- A founding father of epidemiology
- Link between contaminated water and cholera outbreak in London



# Development of the intervention

- Recognised the problem and posed a theory
- Systematically collected and analysed the data
  - Interviews, mapping cases to affected areas, identified barriers and facilitators to infection
- Came to a conclusion and “*respectfully requested an interview*” with the Board of Governors of St. James’ Parish in London
  - Proposed an intervention



# Mapping from TDF to BCT to an intervention component

- TDF domain-  
Environmental context  
and resources
- BCT-restructuring the  
physical environment OR  
avoidance of exposure to  
cues for the behaviour
- Operationalise the BCT
  - Removal of the handle  
from the Broad Street  
water pump



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- Colleagues at QUB, TCD, RCSI, City University of London, NUI Galway and University of Auckland
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- Northern Ireland Clinical Trials Unit