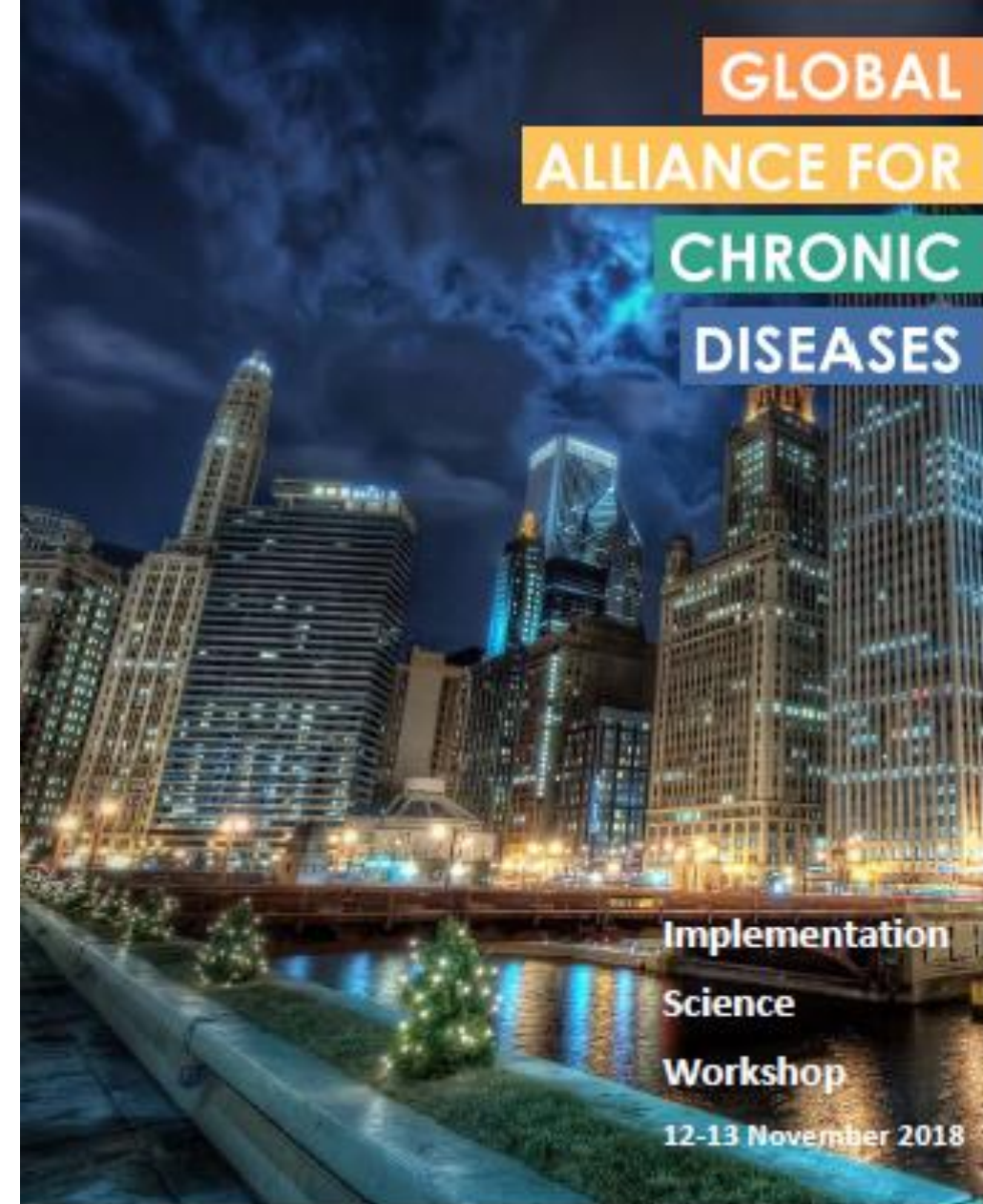
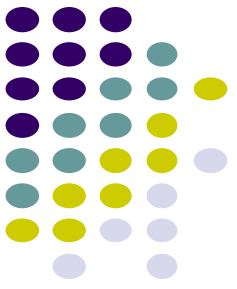


10<sup>th</sup> Implementation Science  
Workshop, Brazil, November,  
2018

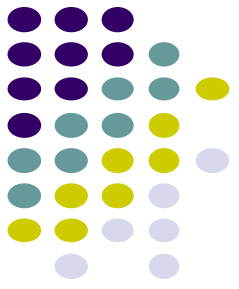


# Task for you



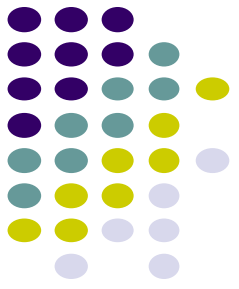
- Why are you here for this WORKSHOP?

# Task for you



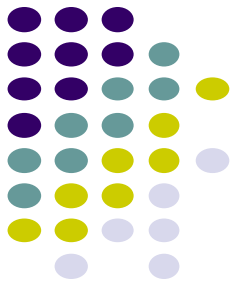
- Why are you here for this week?
- Write down 2-3 things you most want to get from attending this school (your objectives for this week)

# Task for you



- Write down 2-3 things you most want to get from attending this school (your objectives)
- Then, introduce yourself to the person next to you
- Say your name + where you are from + your work interests + one major interest outside work + your objectives for this School (*Each do this*)
- We'll then ask some of you to introduce your 'new' colleague to all of us

# Task for you



- Write down 2-3 things you most want to get from attending this school (your objectives)
  - Then, introduce yourself to the person next to you
  - Say your name + where you are from + your work interests + one major interest outside work + your objectives for this School (*Each do this*)
  - We'll then ask some of you to introduce your 'new' colleague to all of us
- 
- Discuss at your table and identify a couple of common objectives



# Overview of Implementation Science

Brian Oldenburg, PhD  
Professor of Public Health  
The University of Melbourne

&

Director, WHO Global Collaborating  
Centre on Implementation Research for  
NCDs

**1<sup>st</sup> GACD Implementation Science  
Workshop was held in Xi'an, CHINA,  
2014**





# Mexico, 2015 (2<sup>nd</sup> GACD Implementation Science Workshop)





<b>GACD Implementation Science Workshops</b>							
	Male (n)	Female (n)	LMIC (n)	HIC (n)	First time (n)	Attended previously (n)	Attendees (n)
<b>2014 - Xi'an</b>	12	14	13	13	26	0	<b>26</b>
<b>2015 - Mexico City</b>	28	29	47	10	56	1	<b>57</b>
<b>2016 - Sydney</b>	19	22	24	17	31	10	<b>41</b>
<b>2017 - Oxford</b>	6	6	12	0	12	0	<b>12</b>
<b>2017 - Cape Town</b>	4	31	33	2	33	2	<b>35</b>
<b>2017 - Buenos Aires</b>	21	40	44	17	50	11	<b>61</b>
<b>2017 - Chandigarh</b>	19	19	38	0	38	0	<b>38</b>
<b>2018 - Tokyo</b>	22	18	8	32	40	0	<b>40</b>
<b>Total</b>	<b>131</b>	<b>179</b>	<b>219</b>	<b>91</b>	<b>286</b>	<b>24</b>	<b>310</b>

*NB Does not include stats from recent IS workshops in Liverpool (Global Health Systems Conference) and South Africa a fortnight ago*

**Global Alliance for Chronic Diseases**  
**9<sup>th</sup> Implementation Science Workshop**  
*22-23 October 2018*  
*Cape Town, South Africa*



# Inaugural (1<sup>st</sup>) Global Alliance for Chronic Diseases 5-day Implementation Science Training School



GLOBAL  
ALLIANCE FOR  
CHRONIC  
DISEASES

Implementation Science Research Training School  
6 – 10 November 2018







**Faculty for this workshop**

# School Objectives



- Introduction to the field of D&I science, particularly in relation to NCDs, LMICs & resource constrained settings.
- How to study and implement research findings into policy & practice?
- Learn about theories, models, study designs and measurement
- Illustrate ways of collaborating and networking more globally
- Showcase exemplars of D&I science

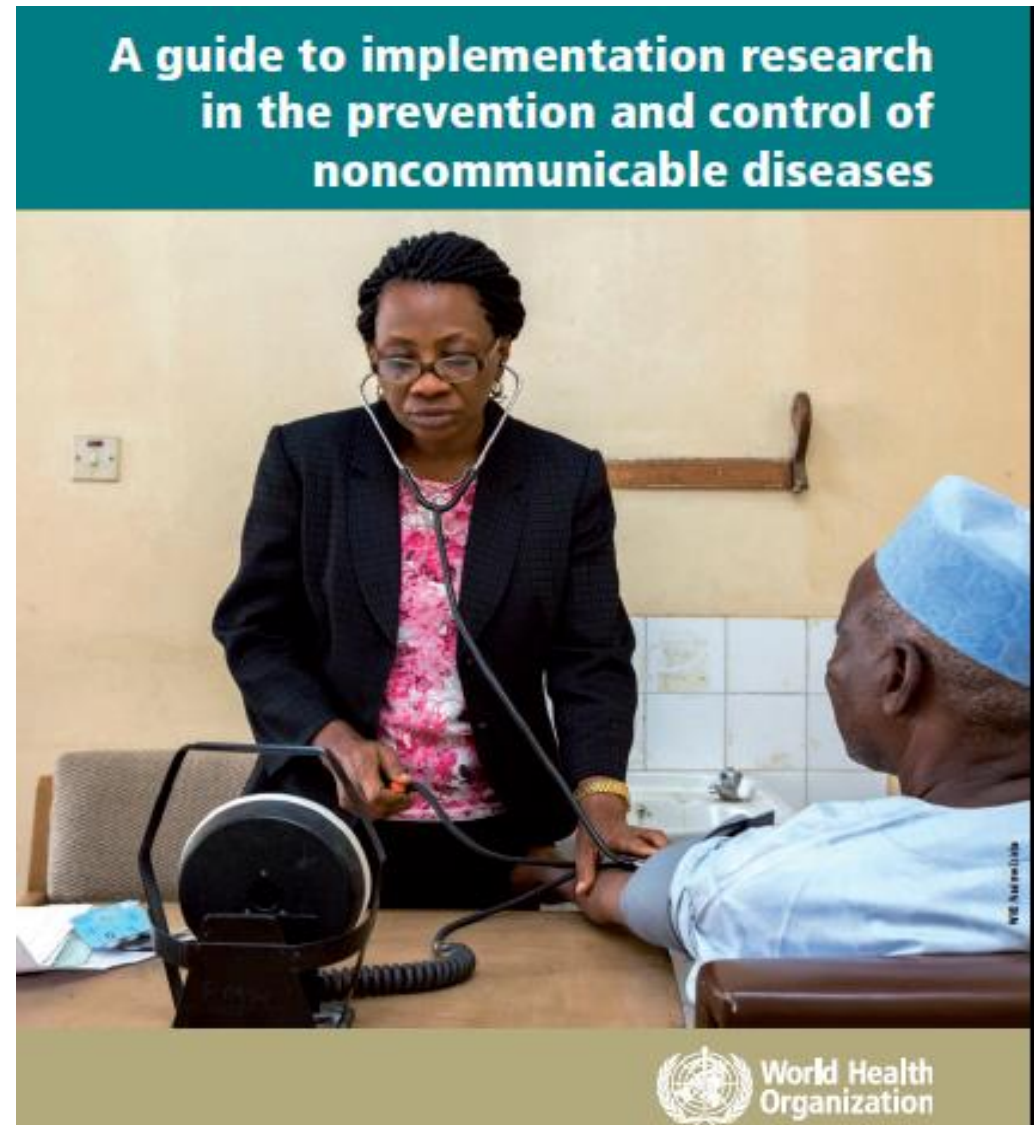




- Program for the week
- Lectures/presentations
- Small group discussion and interaction
- Interactive Q&A and discussion
- Networking and interacting with faculty & one another – learn from one another
- You will receive PDF of all of the talks

[http://www.who.int/ncds/governance/policies/NCD\\_MSA\\_plans/en/](http://www.who.int/ncds/governance/policies/NCD_MSA_plans/en/)

**Recommended citation.** A guide to implementation research in the prevention and control of noncommunicable diseases. Geneva: World Health Organization; 2016.



# Improving Patient Care

THE IMPLEMENTATION OF  
CHANGE IN HEALTH CARE

Edited by  
Richard Grol  
Michel Wensing  
Martin Eccles  
David Davis

Second Edition

 WILEY-BLACKWELL

BMJ| Books

OXFORD

AN INTRODUCTION TO  
**POPULATION-LEVEL  
PREVENTION OF  
NON-COMMUNICABLE  
DISEASES**

EDITED BY

Mike Rayner • Kremlin Wickramasinghe  
Julianne Williams • Karen McColl • Shanthi Mendis

# DISSEMINATION AND IMPLEMENTATION RESEARCH IN HEALTH

Translating Science to Practice



EDITED BY

ROSS C. BROWNSON

GRAHAM A. COLDITZ

ENOLA K. PROCTOR

Standing ovations and physical activity for the next  
2 days!



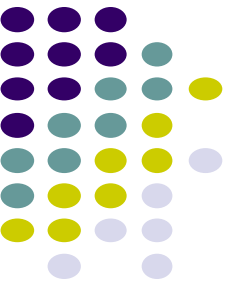


# NCDs and Implementation Science

Brian Oldenburg, PhD  
Professor of Public Health  
The University of Melbourne  
&

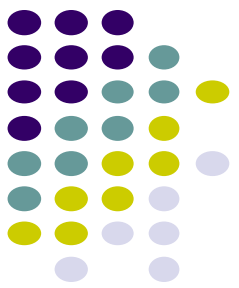
Director, WHO Global Collaborating  
Centre on Implementation Research for  
NCDs

Email: [boldenburg@unimelb.edu.au](mailto:boldenburg@unimelb.edu.au)



“Neglecting implementation  
(science), costs lives and  
money”

# CHALLENGES TO TRADITIONAL OUTCOMES RESEARCH

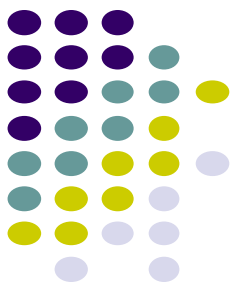


It takes an average of **17 years** before **14% of research findings** are translated into practice.



Balas, E. *Managing clinical knowledge for health care improvement*. Yearbook of Medical Informatics. Stuttgart, Germany: Schattauer; 2000.

Green, L.W. (2006). Public health asks of systems science: to advance our evidence-based practice, can you help us get more practice-based evidence?. *American journal of public health*, 96(3), 406-409.



## CHALLENGES TO TRADITIONAL OUTCOMES RESEARCH

It takes an average of **17 years** before **14%** of research findings are translated into practice.



Balas, E. *Managing clinical knowledge for health care improvement*. Yearbook of Medical Informatics. Stuttgart, Germany: Schattauer; 2000.

Green, L.W. (2006). Public health asks of systems science: to advance our evidence-based practice, can you help us get more practice-based evidence?. *American journal of public health*, 96(3), 406-409.

# Why does it take so long and why is the uptake so poor?

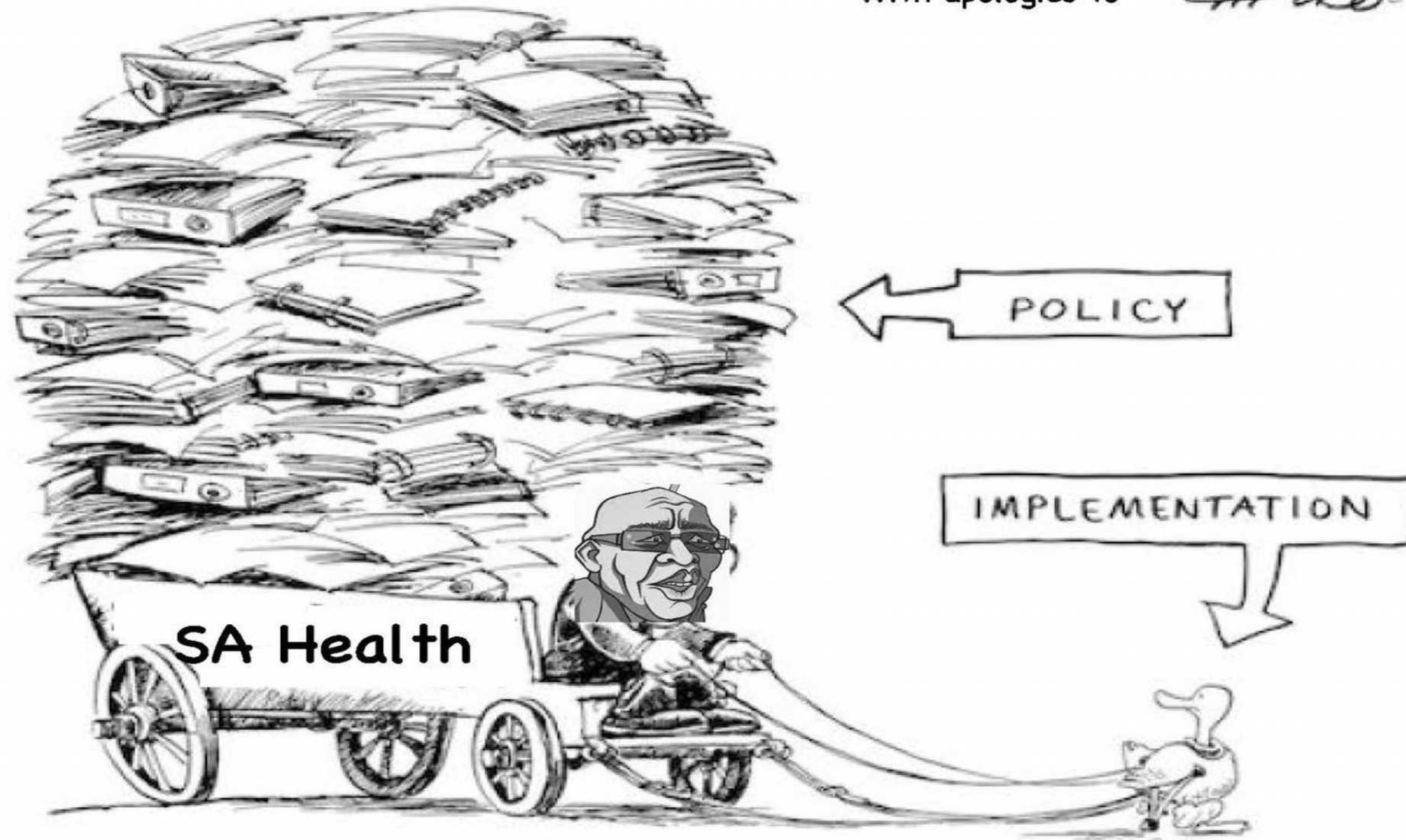
**Some of the reasons???????**

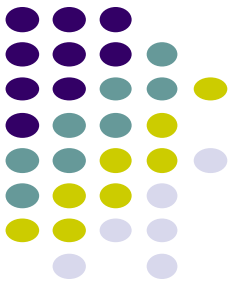
# Some of the reasons

- Researchers not asking policy salient questions and/or research is not very important to policymakers/program implementers/professionals
- Findings conflict with vested interests and involve “disruption” with current approaches
- The way we conduct science is very slow and non-responsive to the demands of policymakers/program implementers/professionals
- Researchers not good at knowledge translation into policy and practice
- ETC
- ETC



With apologies to *ZAPIRO*®





**What is the most common kind of research dissemination/“translation”?**

Most Common Type of Research Translation?

## **Bench to Bookshelf**



**+ Conferences + Guidelines**

This workshop is all about doing better than this,  
particularly in LMIC and resource constrained  
settings

# Implementation Research

## **KNOW**

Interventions are effective in clinical & controlled-research settings

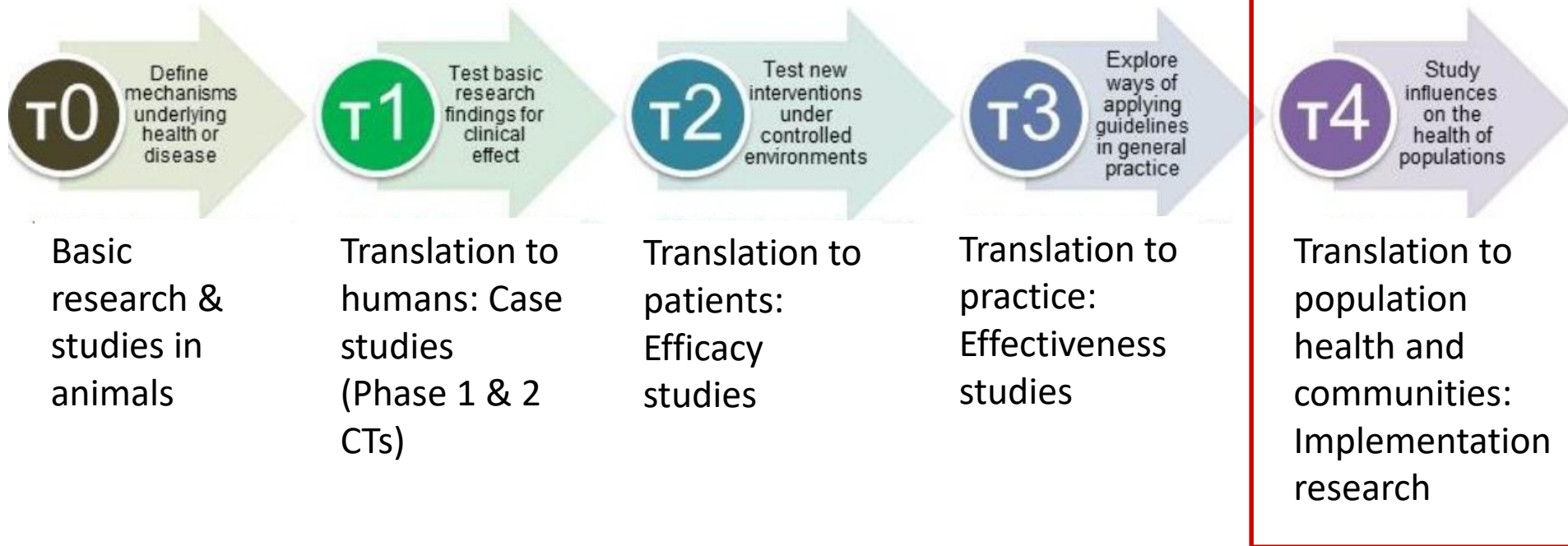


## **DO**

Proven interventions are not well adapted to and/or implemented in the “real world”



# Translational Research





# Implementation research: new imperatives and opportunities in global health



*Sally Theobald, Neal Brandes, Margaret Gyapong, Sameh El-Saharty, Enola Proctor, Theresa Diaz, Samuel Wanji, Soraya Elloker, Joanna Raven, Helen Elsey, Sushil Bharal, David Pelletier, David H Peters*

Implementation research is important in global health because it addresses the challenges of the know–do gap in real-world settings and the practicalities of achieving national and global health goals. Implementation research is an integrated concept that links research and practice to accelerate the development and delivery of public health approaches. Implementation research involves the creation and application of knowledge to improve the implementation of health policies, programmes, and practices. This type of research uses multiple disciplines and methods and emphasises partnerships between community members, implementers, researchers, and policy makers. Implementation research focuses on practical approaches to improve implementation and to enhance equity, efficiency, scale-up, and sustainability, and ultimately to improve people's health. There is growing interest in the

Published Online  
October 9, 2018  
[http://dx.doi.org/10.1016/S0140-6736\(18\)32205-0](http://dx.doi.org/10.1016/S0140-6736(18)32205-0)

Department of International Public Health, Liverpool School of Tropical Medicine, Liverpool, UK (Prof S Theobald PhD, J Raven PhD); US Agency for International Development.

# The defining characteristics of implementation research are:

Context specific

Relevant and  
agenda setting

Method fit for  
purpose

Demand driven

Multi-  
stakeholder and  
multidisciplinary

Real world

Real Time

Focuses on  
process and  
outcomes



# TIME TO DELIVER



Third UN High-level Meeting  
on Non-communicable Diseases

Very big  
challenge for  
the world





The *3<sup>rd</sup> UN High-Level Meeting on Non-Communicable Diseases* (NCDs) met on Sept 27, 2018 to review national and global progress towards the SDG target.....

# UN Sustainable Development Goals – NCDs

Unlike the previous Millennium Development Goals (MDGs), the recent Sustainable Development Goals (SDGs) now formally recognize NCDs (SDG Target 3.4) **by 2030**):

- **Reduce by one third premature mortality from NCDs**
- Strengthen responses to reduce the harmful use of alcohol
- Achieve universal health coverage (UHC)
- Strengthen the implementation of the WHO Framework Convention on Tobacco Control (FCTC)
- Support the research and development of vaccines and medicines for NCDs that primarily affect developing countries
- Provide access to affordable essential medicines and vaccines for NCDs

Are most countries on track to achieve this goal of a 30% reduction in premature mortality by 2030?

Are most countries on track to achieve this goal of a 30% reduction in premature mortality by 2030?

**What do you think?**

# www.thelancet.com Vol 392 September 22, 2018

- Sustainable Development Goal (SDG) target 3.4— that is, a one-third reduction, relative to 2015 levels, in the probability of dying between 30 years and 70 years of age from diabetes, cancers, cardiovascular diseases and chronic respiratory by 2030—will only be achieved in 35 countries (19%) for women, and 30 (16%) for men, if these countries maintain or surpass their 2010–2016 rate of decline in NCD mortality.
- Most of these achieving countries are already high income countries with already-low NCD mortality.



THE LANCET

Imperial College  
London



NCD  
Countdown  
2030



NCD Alliance



World Health  
Organization

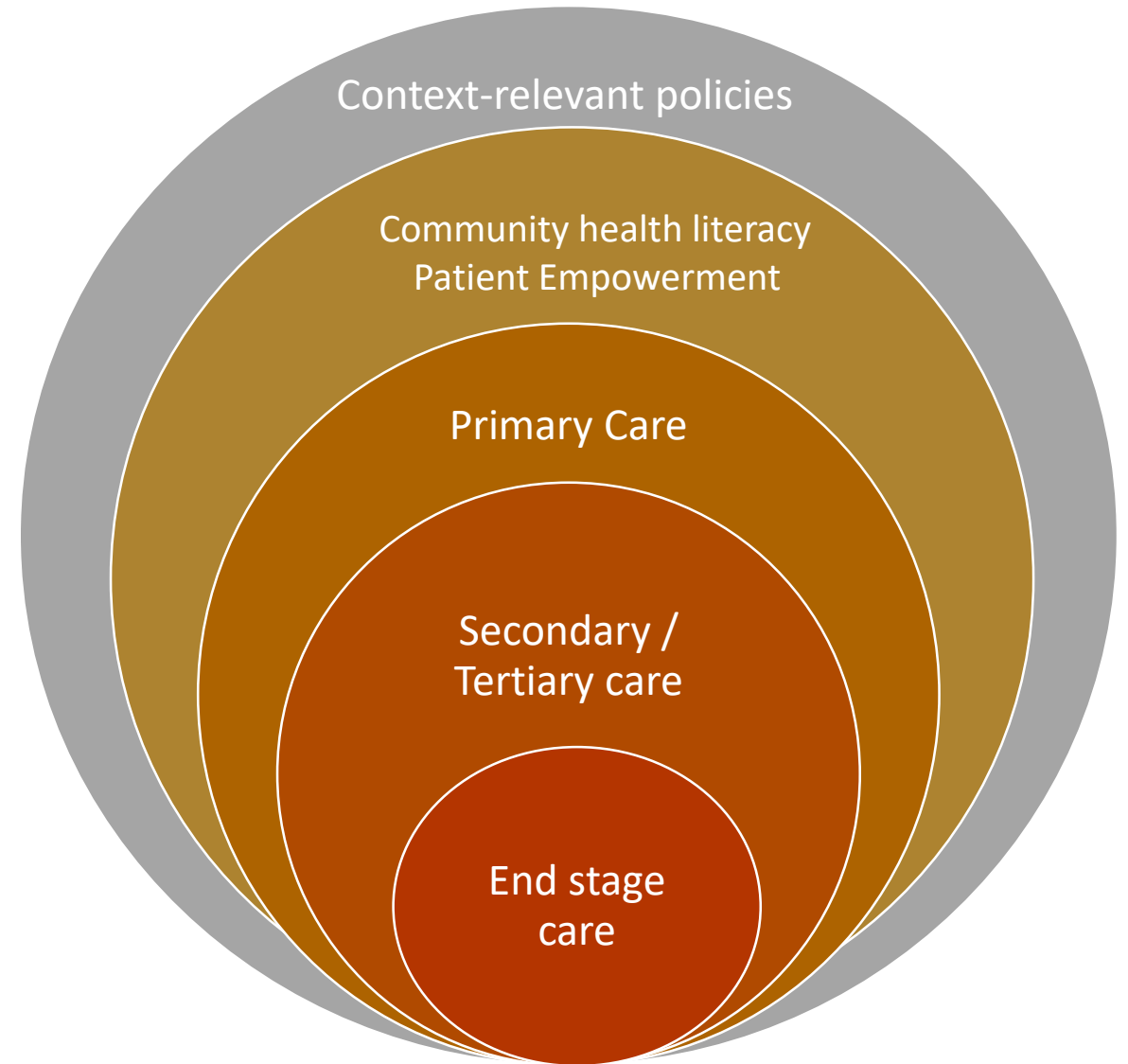
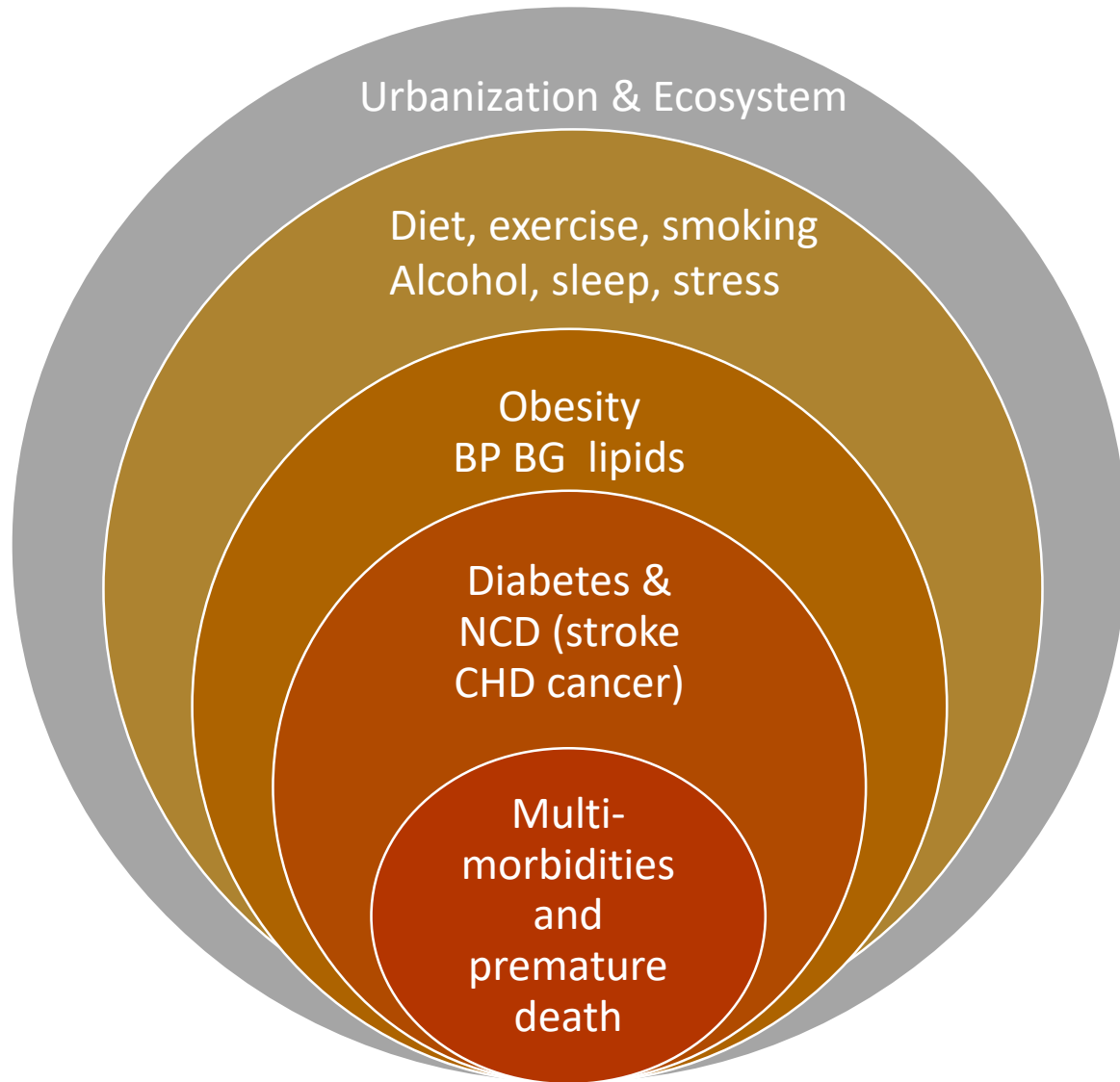
NCD Countdown 2030: worldwide trends in  
non-communicable disease mortality and progress towards  
Sustainable Development Goal target 3.4

[www.thelancet.com](http://www.thelancet.com) Vol 392 September 22, 2018

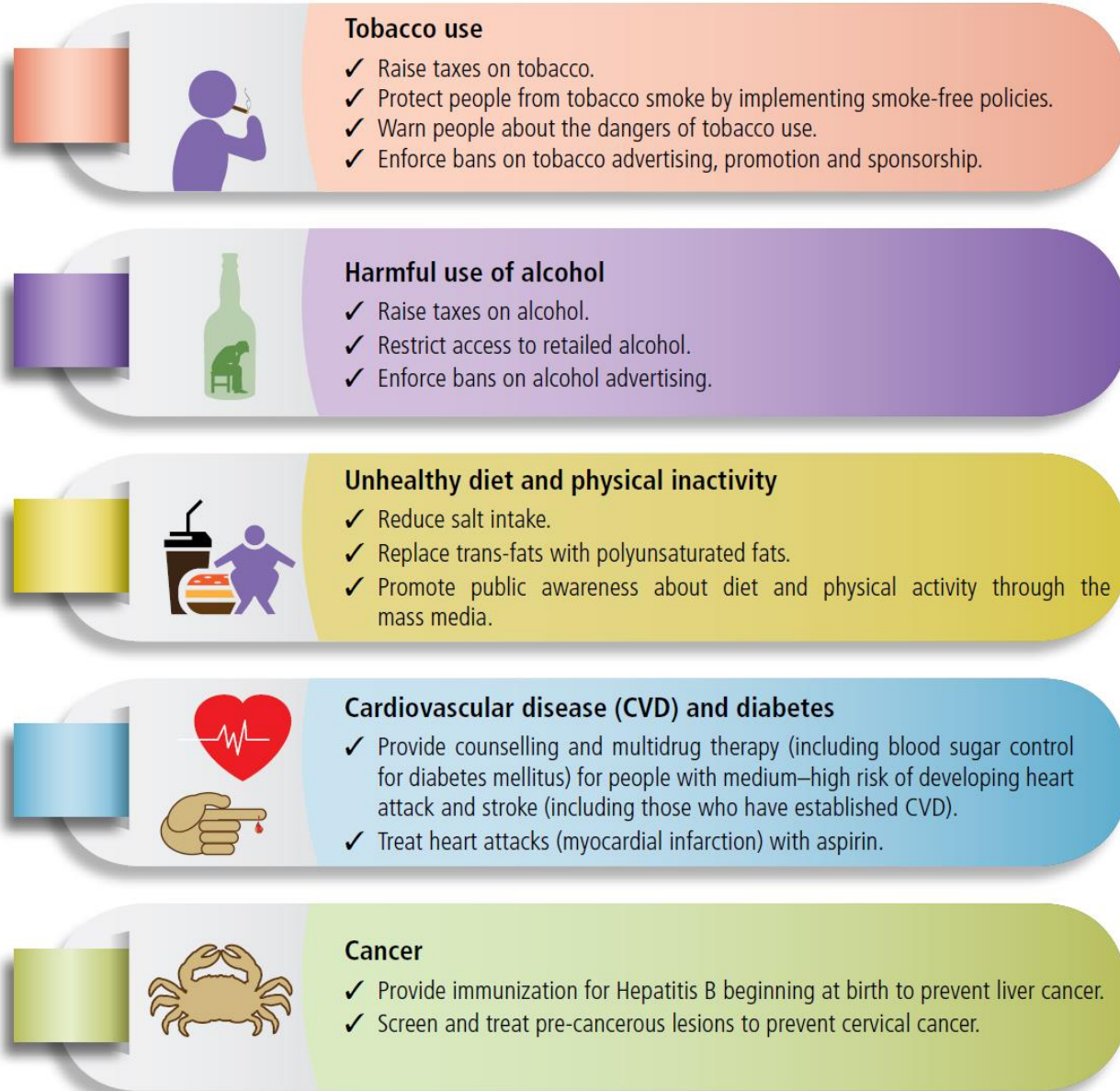
Heads of State and Government made a bold commitment in SDG target 3.4—to reduce, by 2030, premature mortality from non-communicable diseases by one third, through prevention and treatment and the promotion of mental health and well-being.

So, how can countries do better— both in HICs and LMICs?

# Addressing NCDs at a societal level requires policies and system level interventions and integration



## “Best buys” for prevention and control of NCDs



## WHO evidence-based ‘Best Buys’ for NCD prevention & control

### Little consideration of:

- Costs of implementation
- Adapting to country context
- Capacity to implement and evaluate
- Need to build capacity is long term

## WHO 'Best Buys' for NCDs....

- Good evidence for group interventions in reducing tobacco use.
- Weaker evidence for tobacco interventions targeting individuals.
- Fewer studies on smoking bans, warning labels and mass media campaigns, and no studies on taxes or marketing restrictions.
- Supportive evidence that cervical screening and hepatitis B immunisation prevent cancer in LMICs
- **Fourteen of the 'best buy' interventions did not have ANY good evidence for effectiveness in LMICs, including those related to changing diet, physical activity etc.**
- **Very little evidence about HOW to adapt and implement**

Allen, L. N., et al. (2018). Evaluation of research on interventions aligned to WHO 'Best Buys' for NCDs in low-income and lower-middle-income countries: a systematic review from 1990 to 2015. *BMJ Global Health* 3(1)

Urgent need for more evidence about HOW to implement what we already know (including **Best Buys**), particularly for LMICs



Urgent need for more evidence about HOW to implement what we already know  
(including **Best Buys**), particularly for LMICs

## Field of Implementation Science

<b>Implementation</b>	A specified set of activities designed to put into practice a policy or intervention of known dimensions (15)	<p>Implementation processes are:</p> <ul style="list-style-type: none"> <li>■ purposeful</li> <li>■ described in sufficient detail to allow independent observers to detect the presence and quality of the specific set of implementation-related activities (16)</li> </ul>
<b>Implementation research</b>	The scientific study of the processes used to implement policies and interventions and the contextual factors that affect these processes (17)	<p>Investigates all aspects of implementation, including:</p> <ul style="list-style-type: none"> <li>■ the uptake of evidence-based policies and interventions</li> <li>■ activities used to put these into practice</li> <li>■ factors that influence these activities</li> <li>■ impact of factors on health outcomes</li> </ul>

*Ref: A guide to implementation research in the prevention and control of noncommunicable diseases. Geneva: World Health Organization; 2016.*

- Implementation Research is the scientific study of methods to promote the systematic uptake of ~~clinical~~ research findings and other evidence-based practices and into public health practice and hence to improve the quality (effectiveness, reliability, safety, appropriateness, equity, efficiency) of public health interventions.

- Eccles et al., An Implementation research agenda, Implementation Science, 2006

.....The scientific inquiry into questions concerning implementation – the act of carrying an intention into effect, which in health research can be policies, programmes, or individual practices.....

- Peters et al., 2013

- CONTEXT is important
  - “Implementation research studies should not assume that empirically-supported interventions can be transferred into any service setting without attention to local context, nor that a unidirectional flow of information (e.g., publishing a recommendation, trial, or guideline) is sufficient to achieve practice change.”





# Implementation Research Traditions

- Quality Improvement Science
- Operational Research
- Policy Implementation and evaluation
- Programme Evaluation
- Dissemination and Implementation of Evidence based medicine
- Participatory Action research





# Implementation Research Traditions

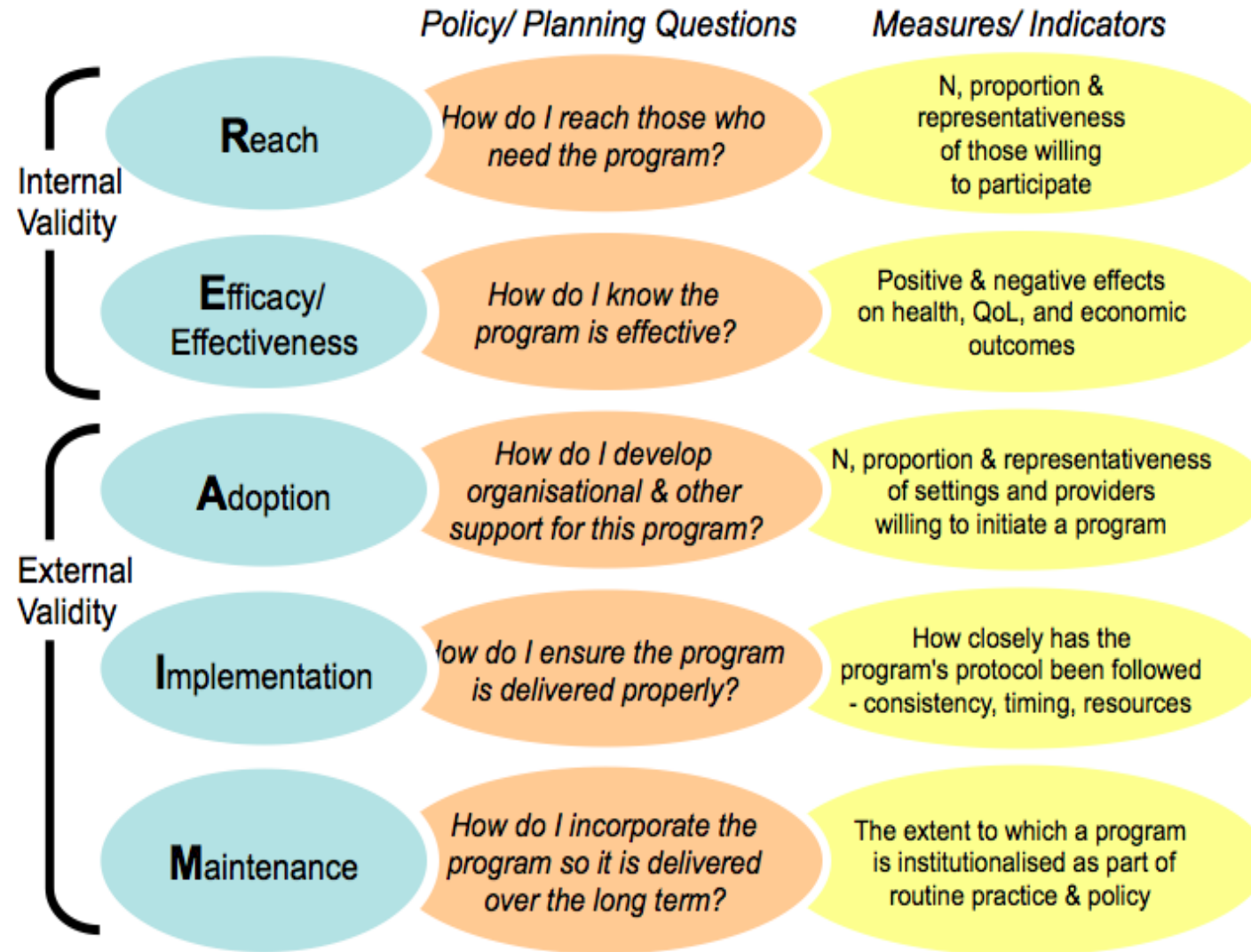
- Quality Improvement Science
- Operational Research
- Policy Implementation and evaluation
- Programme Evaluation
- Dissemination and Implementation of Evidence based medicine
- Participatory Action research
- Intersection of public health sciences + social/behavioral sciences + policy sciences
- Think more explicitly about population impact and benefit

# Public health benefit is not just determined by evidence of efficacy/effectiveness, but also by:

- Reaching large numbers of people for most benefit by adapting, refining and translation...
- Being widely adopted in many different settings/contexts
- Being consistently implemented with moderate levels of training and expertise
- Producing replicable and long-lasting effects (and minimal negative impacts) at reasonable cost

Glasgow's REAIM framework

# Glasgow RE-AIM framework

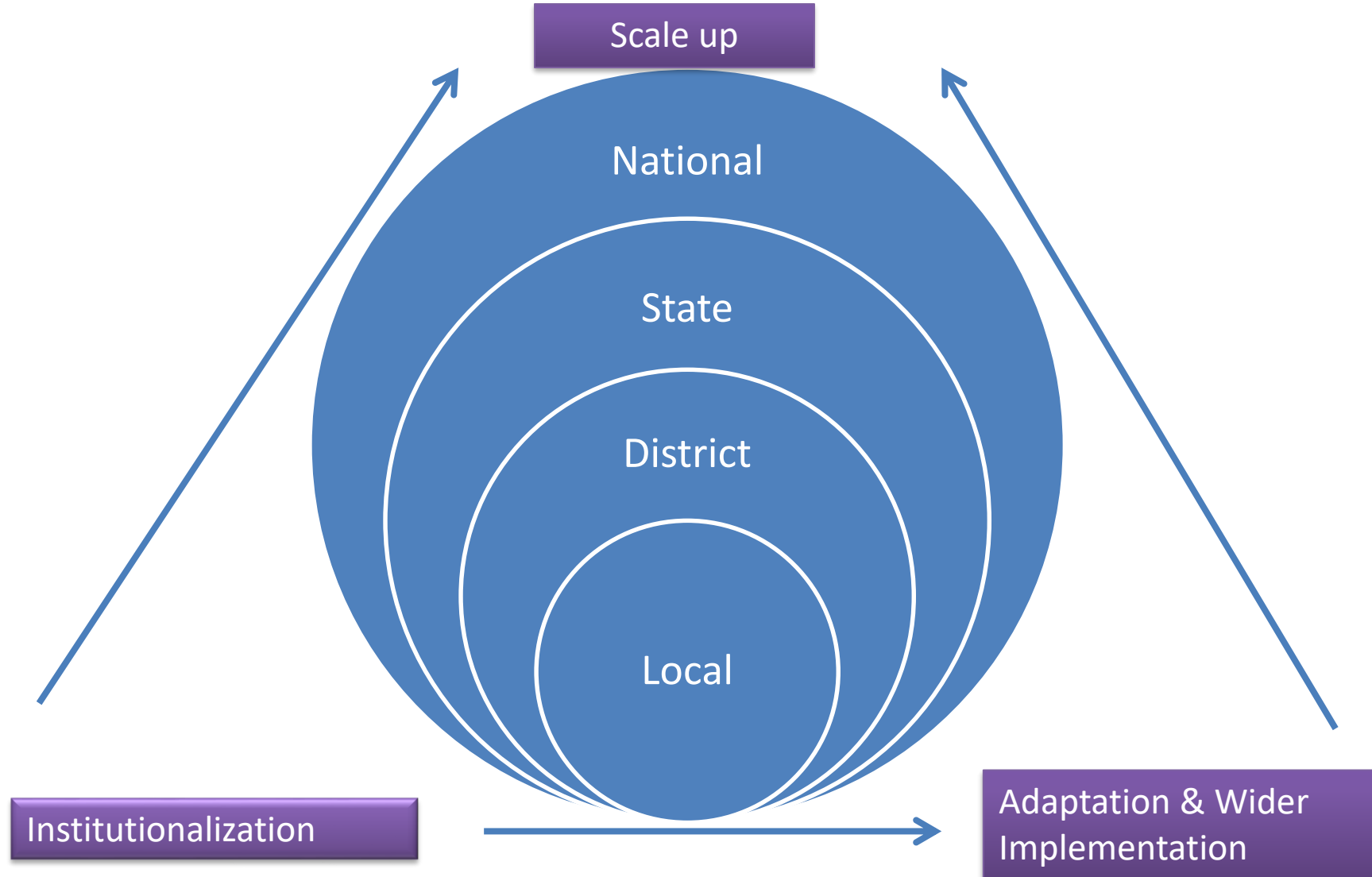


# RE-AIM

- A systematic way for researchers, practitioners, and policy makers to evaluate health behavior/service/public health interventions.
- It can be used to estimate the potential impact of interventions on public health.

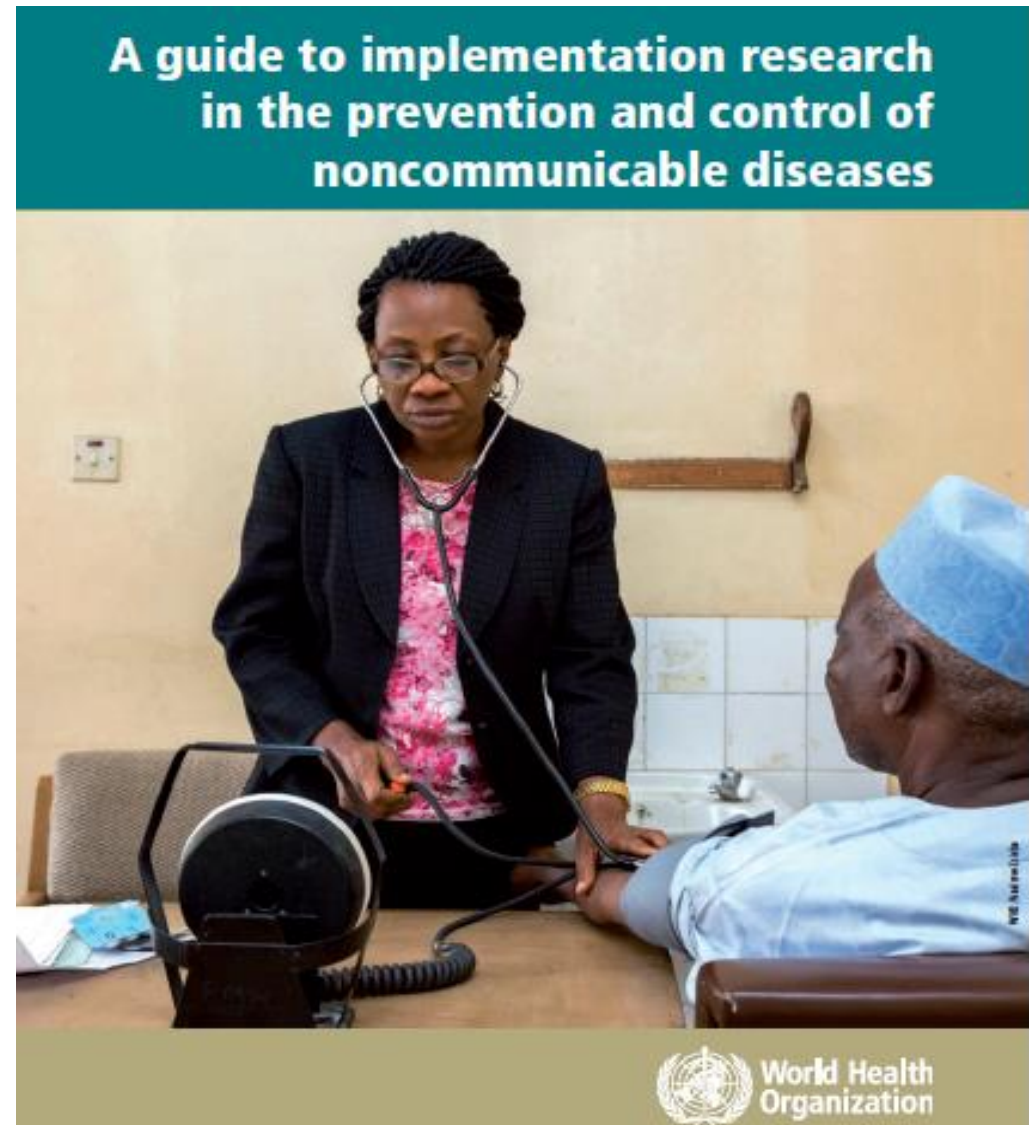


# Scaling up of interventions and programs into policy and widespread practice



[http://www.who.int/ncds/governance/policies/NCD\\_MSA\\_plans/en/](http://www.who.int/ncds/governance/policies/NCD_MSA_plans/en/)

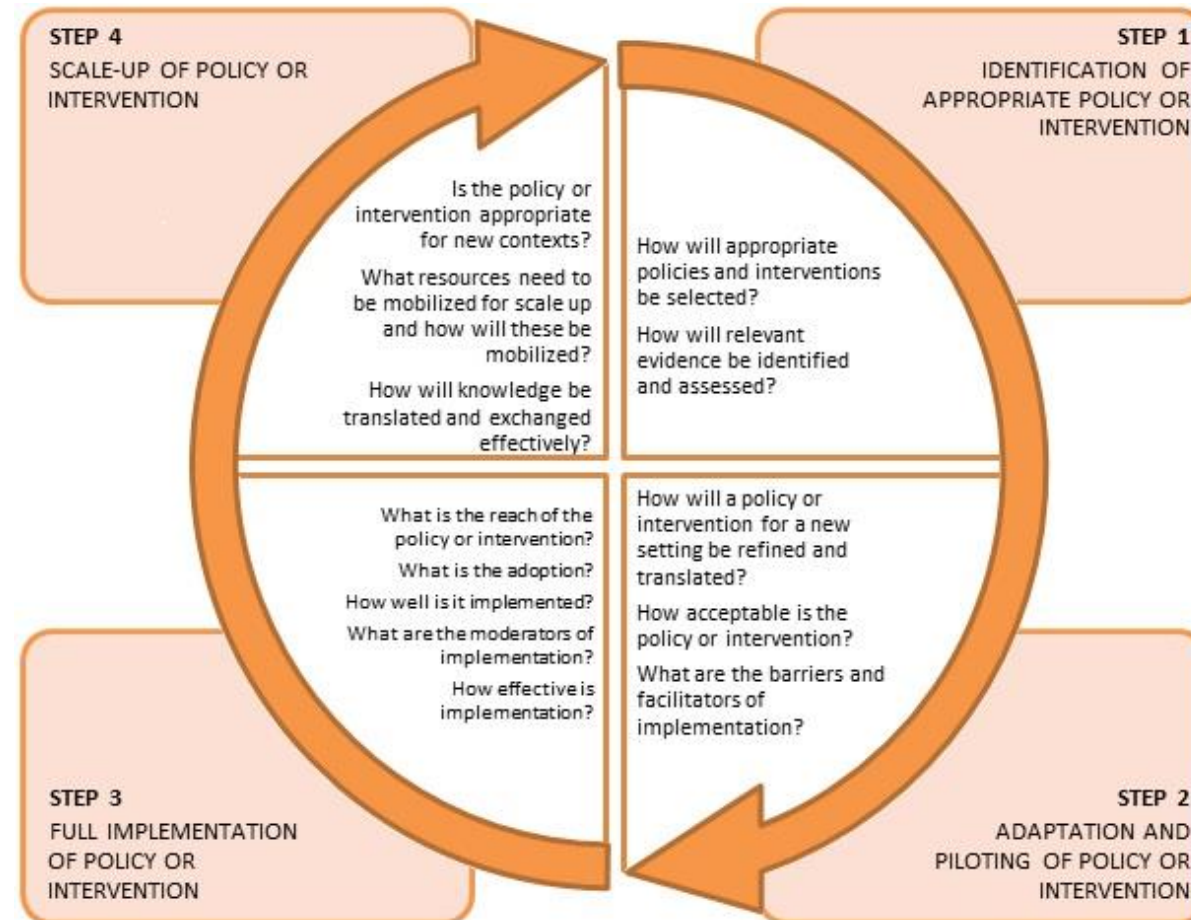
**Suggested citation.** A guide to implementation research in the prevention and control of noncommunicable diseases. Geneva: World Health Organization; 2016.





# WHO Guide – Framework Model

## Relationship between implementation and the implementation research cycle



# Summary

- WHAT (“Best Buys”) we already know about for improving the prevention and management of NCDs needs to be better tailored and adapted to countries, settings and context
- The evidence about HOW to implement policies and programs – particularly in LMICs – is a fraction of what we know about ‘what to do’.
- Prioritizing evidence for implementation is also very important

## Summary (2)

Implementation research:

- Involves the scientific study of implementation processes and the contextual factors that affect them.
- Helps identify the most efficient and cost-effective methods of implementation.
- Should be embedded in all stages involving the selection, adaptation and evaluation of policies or interventions

Knowledge generated by implementation research should be shared widely.

# The defining characteristics of implementation research are:

Context specific

Relevant and  
agenda setting

Method fit for  
purpose

Demand driven

Multi-  
stakeholder and  
multidisciplinary

Real world

Real Time

Focuses on  
process and  
outcomes

Thank you



# Implementation Research: From Problems to Solutions to Outcomes

**Rajesh Vedanthan, MD MPH**

Director, Section for Global Health

Associate Professor, Departments of Population Health and Medicine

New York University School of Medicine



# Disclosures

I receive financial support from the following company or companies related to the products listed below. These relationships may lead to bias in my presentation.

Entity	Type(s) of relationship(s)	Product name(s)	Relevant disease(s) or condition(s)
NONE			

K01TW009218

R01HL125487

U01HL114200

U01HL138636

U01HL142099

R21HL140474

14SFRN20490315



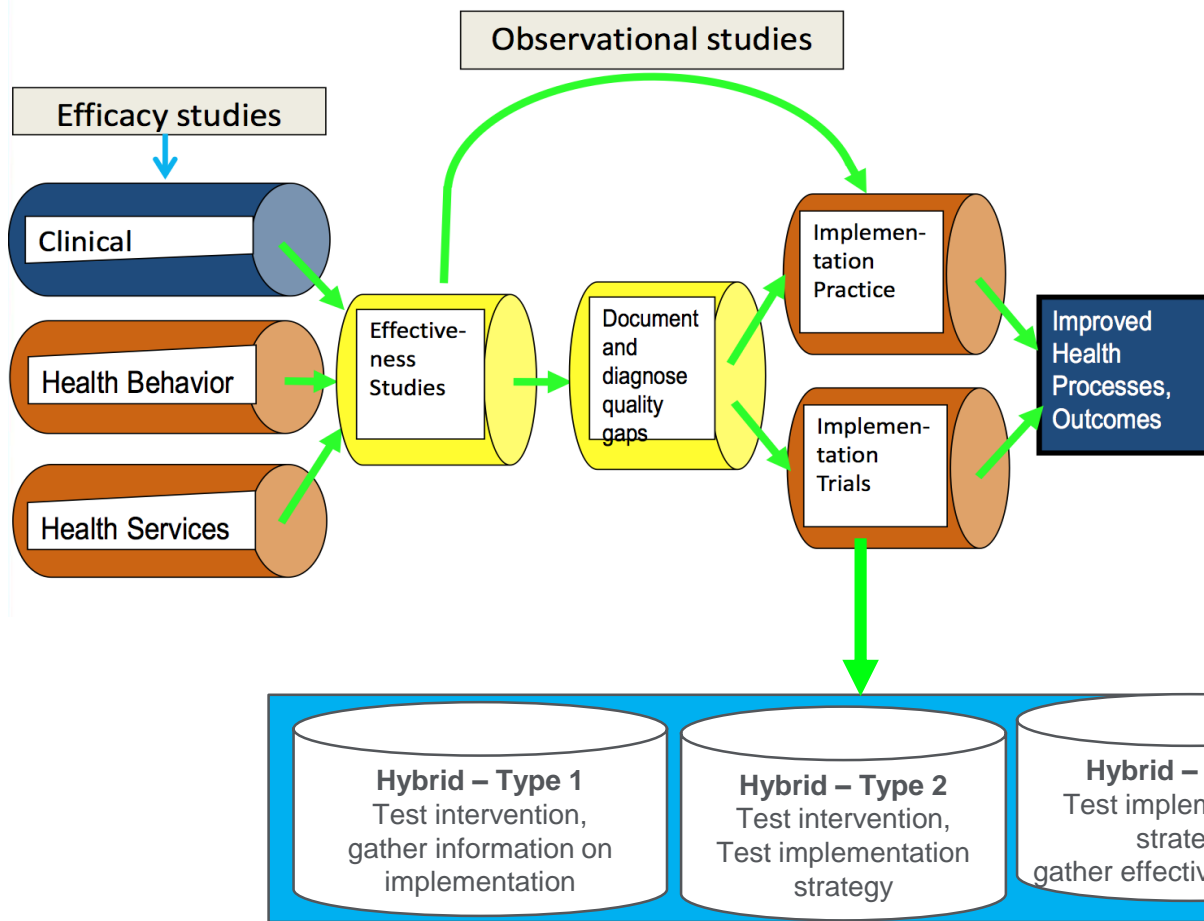
# Implementation research

- Implementation research is the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services and public health
- It includes the study of influences on healthcare professional and organizational behaviour.
- (Eccles/Mittman, 2006)

# Knowledge-Practice (Know-Do) Gap

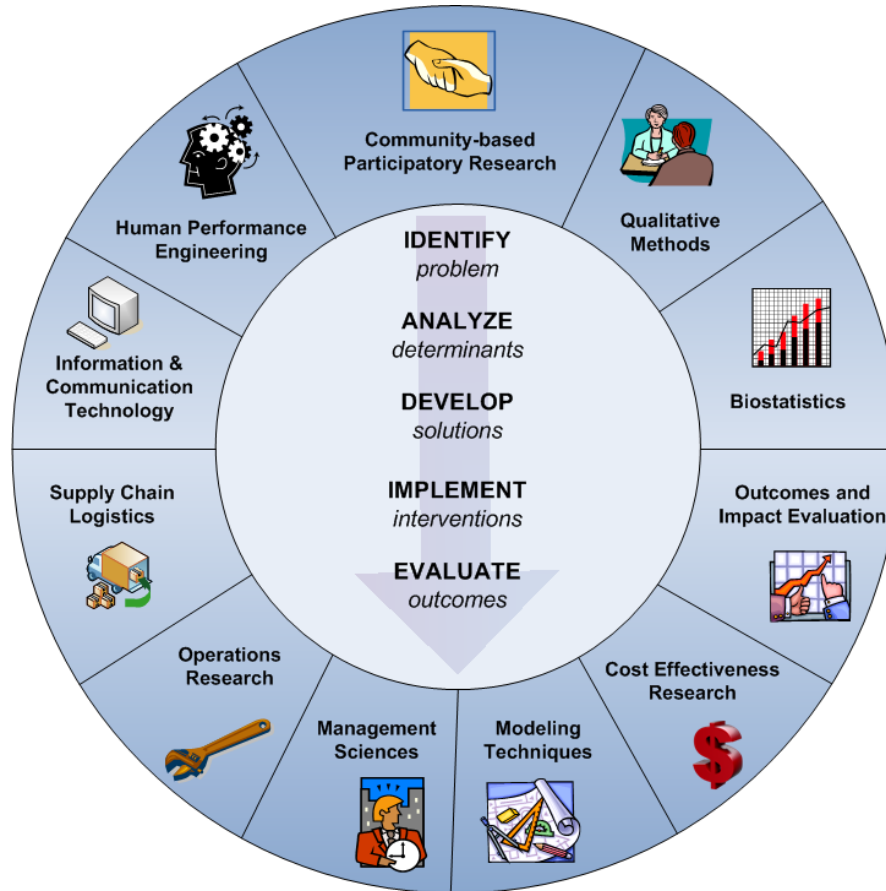


# Implementation pipeline- Mittman & Curran 2012

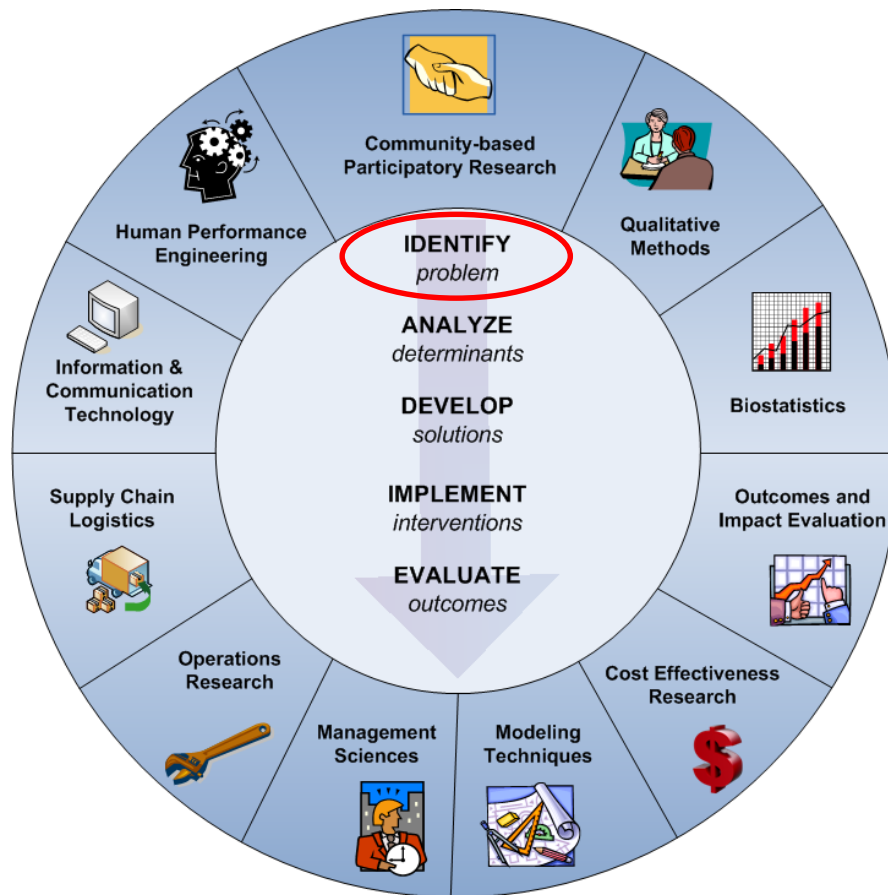


[illegible]

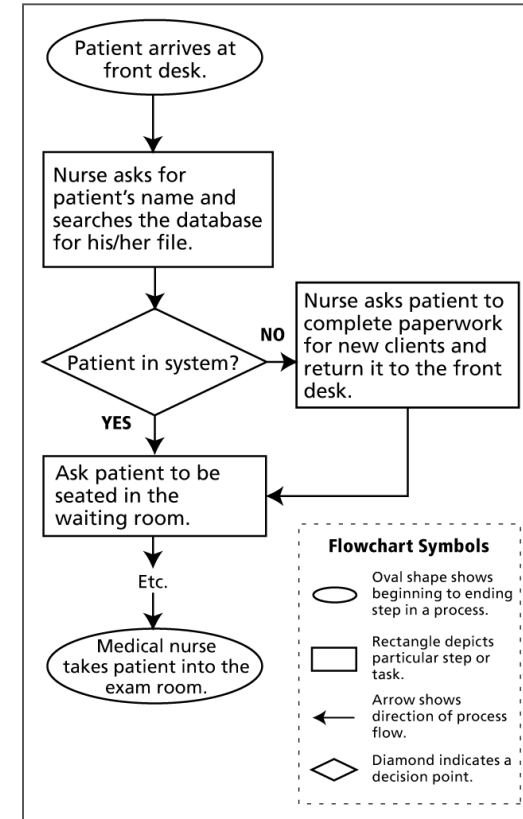
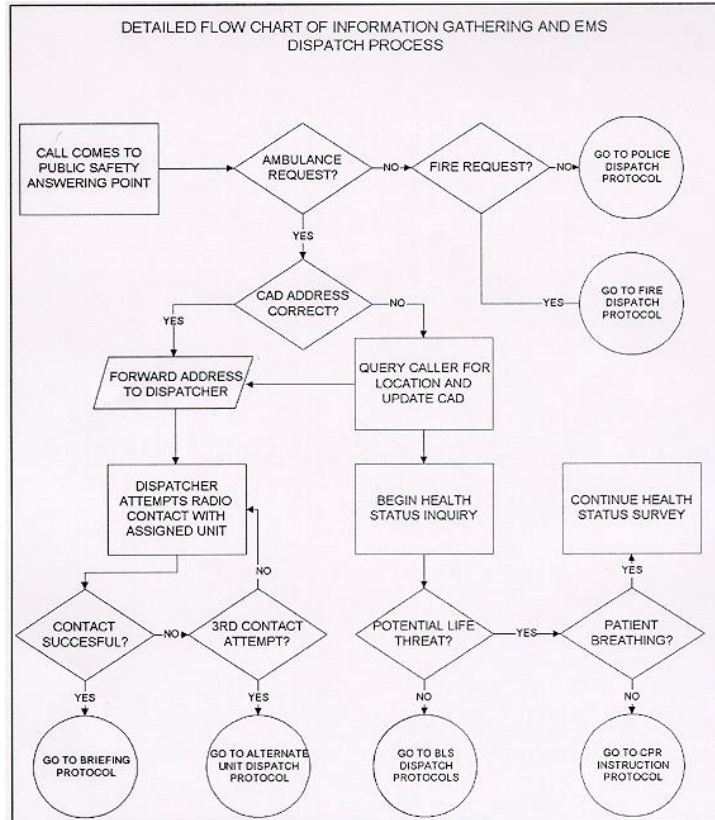
# Implementation Research



# Implementation Research

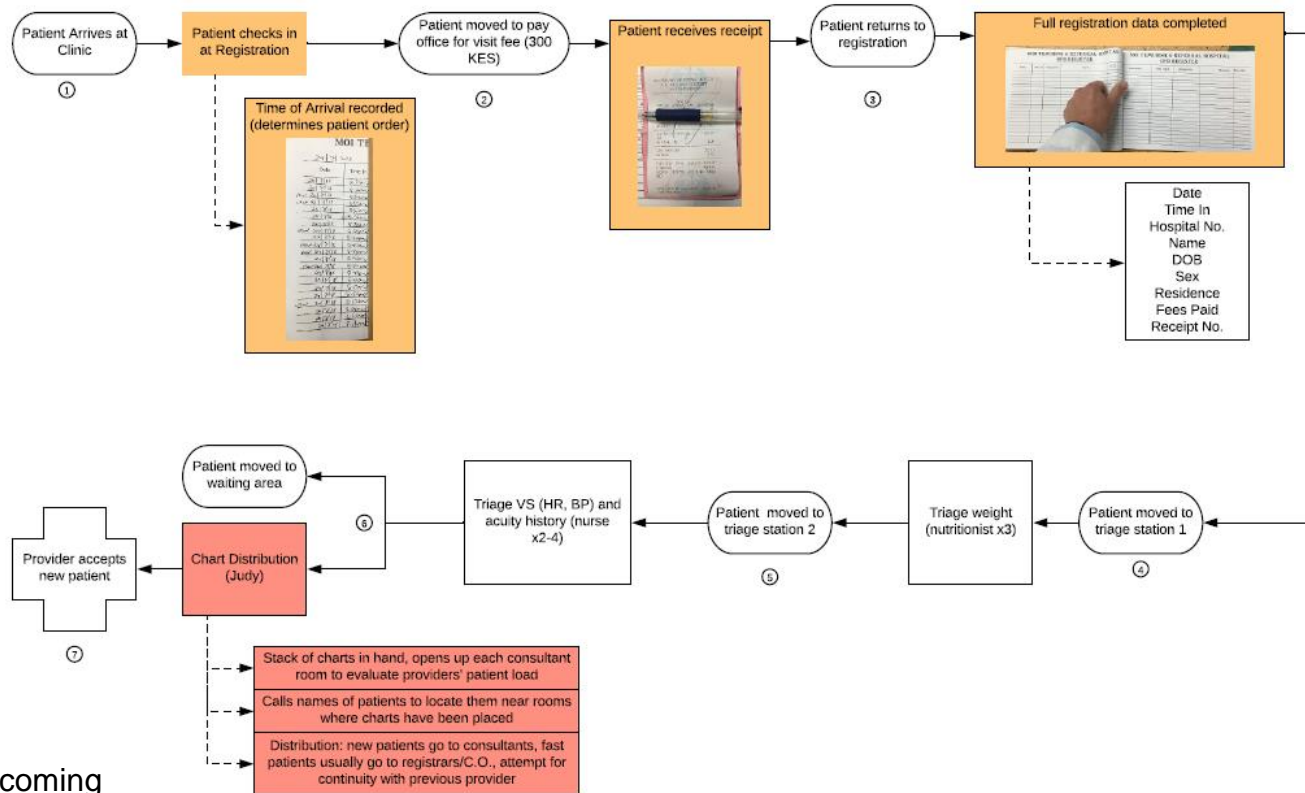


# Problem Analysis—Flow Chart

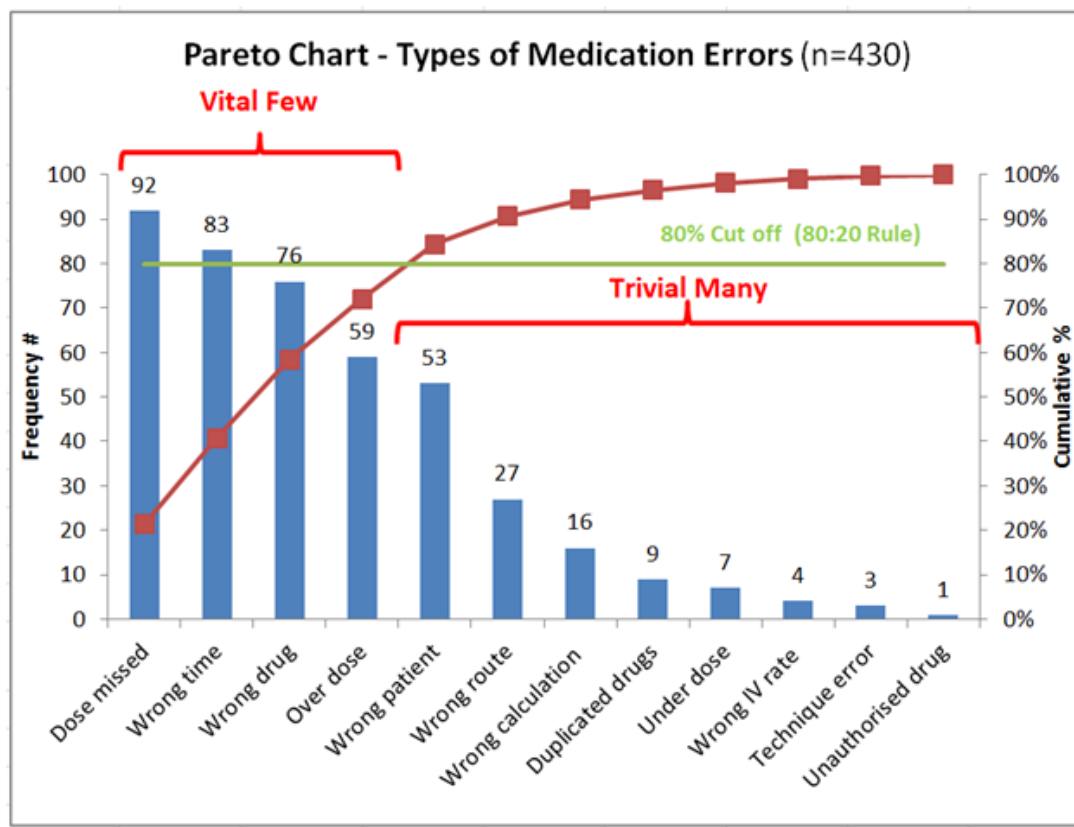




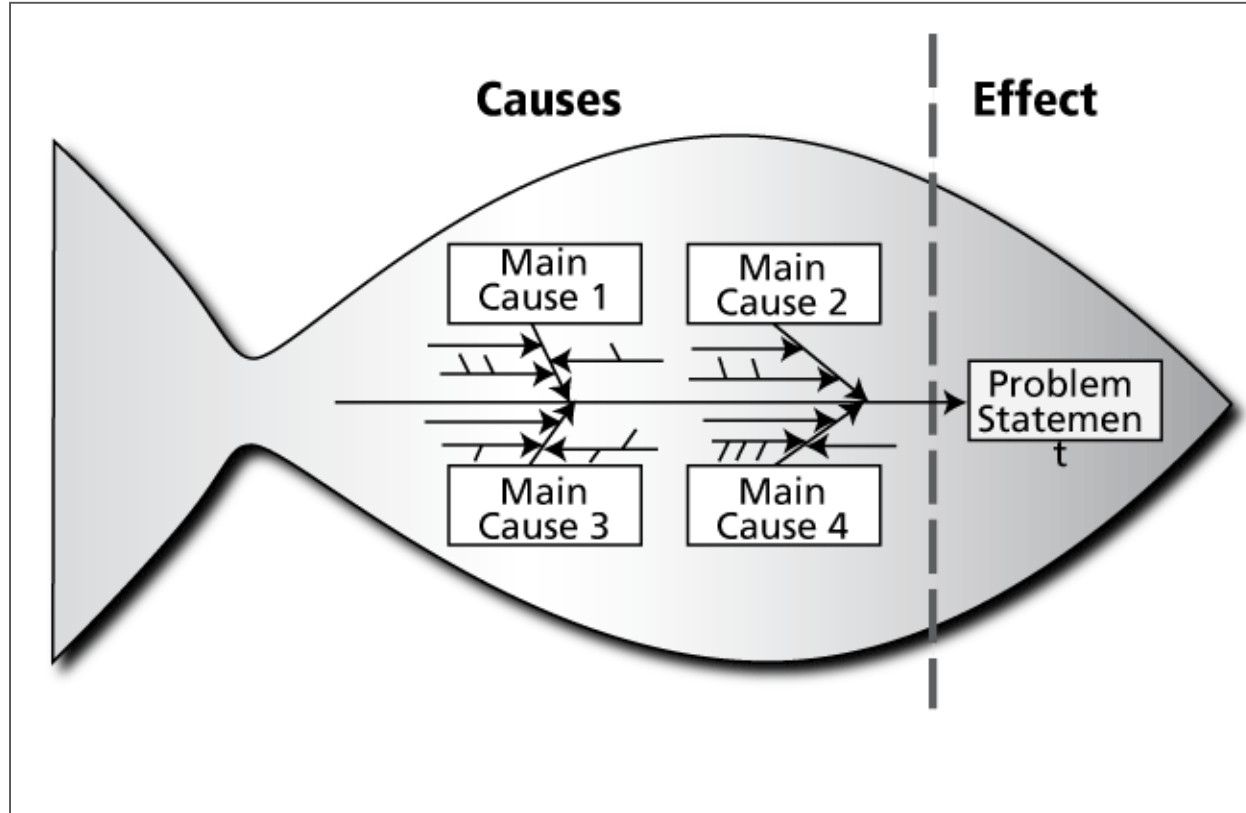
# Process Map – Task Map



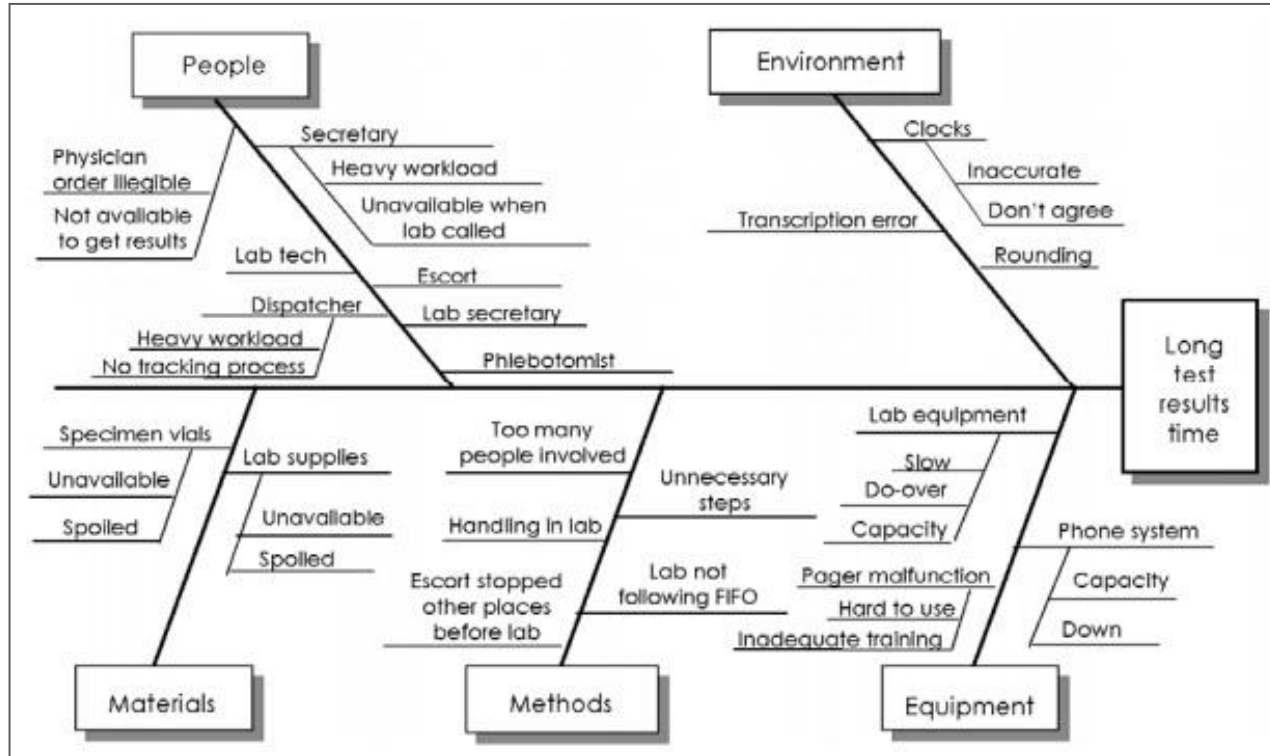
# Problem Analysis—Pareto Chart



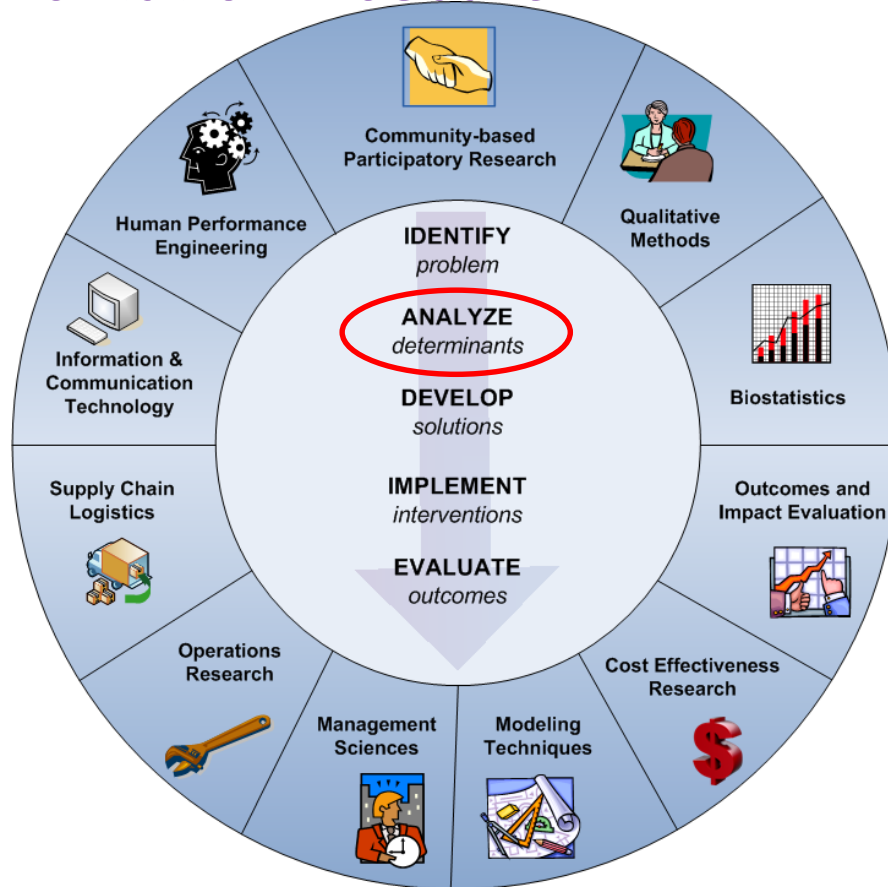
# Problem Analysis—Fishbone/Ishikawa Diagram



# Problem Analysis—Fishbone/Ishikawa Diagram

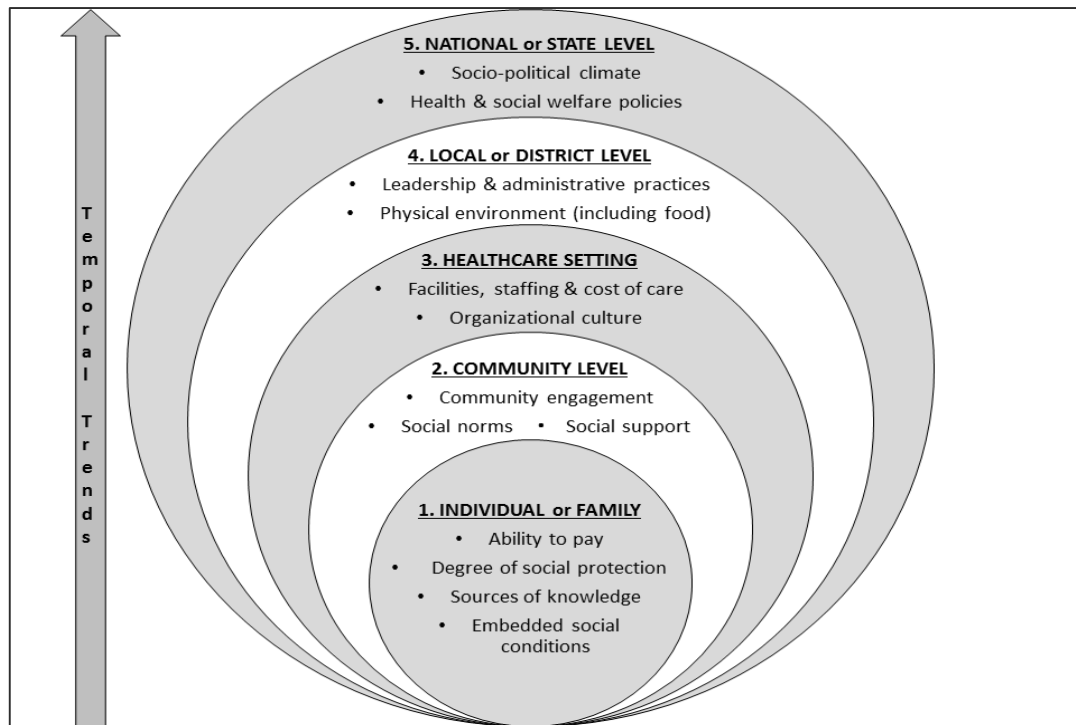


# Implementation Research



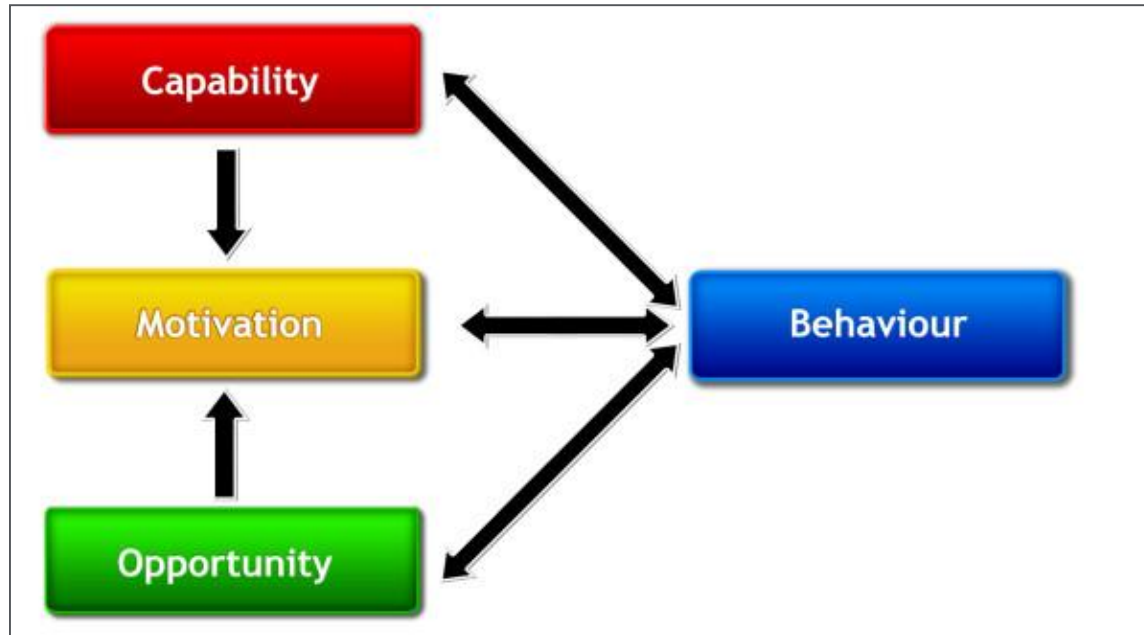
# Analyze Determinants

- Context, Agency, Structure



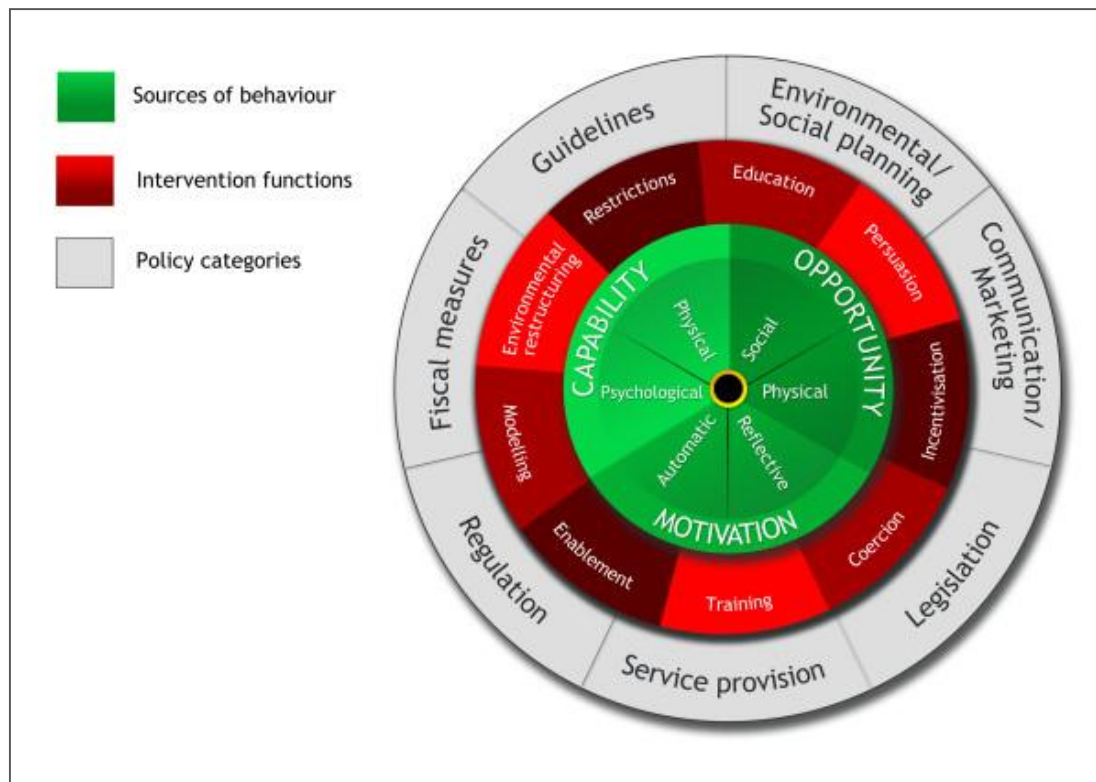
# Determinants

- Behavior








# Behavior Change Wheel

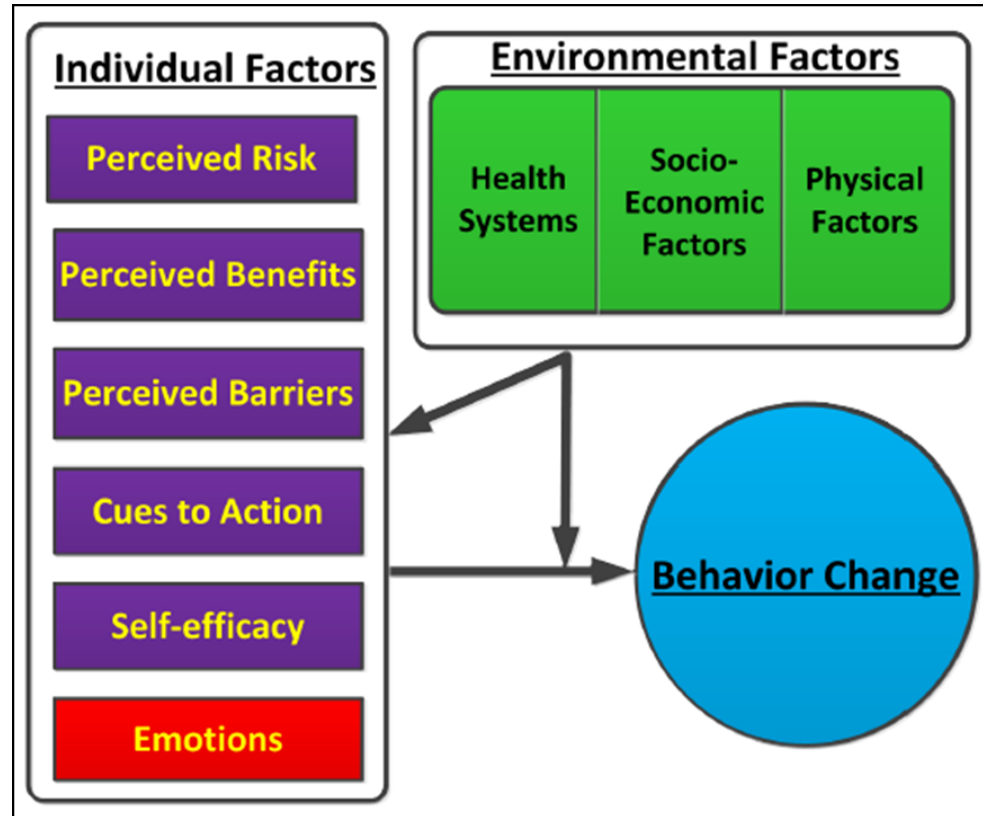


# Other examples...

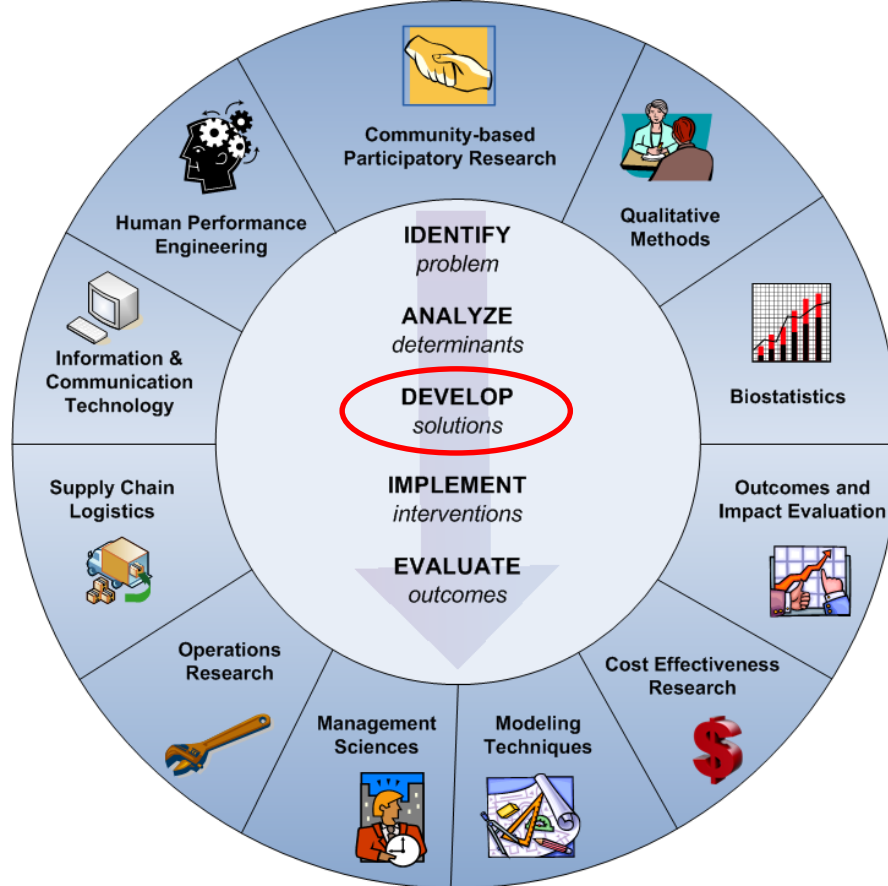
## (there are MANY)

SOCIO- ECOLOGICAL LEVEL	THEORY	FOCUS
	Health Belief Model	Individuals' perception of the threat of a health problem and the appraisal of recommended behavior(s) for preventing or managing the problem.
Individual	Theory of Planned Behavior	Individuals' behavioral intention is the most important determinant of behavior.
	Stages of Change (Transtheoretical Model)	Individuals' readiness to change or attempt to change toward healthy behaviors.
Interpersonal	Social Learning Theory	Behavior is explained via a three-way, dynamic reciprocal theory in which personal factors, environmental influences and behavior continually interact.
	Diffusion of Innovation Theory	Addresses how new ideas, products and social practices spread within a society or from one society to another.
Community		

# Modified HBM: LARK



# Implementation Research



# Intervention Selection

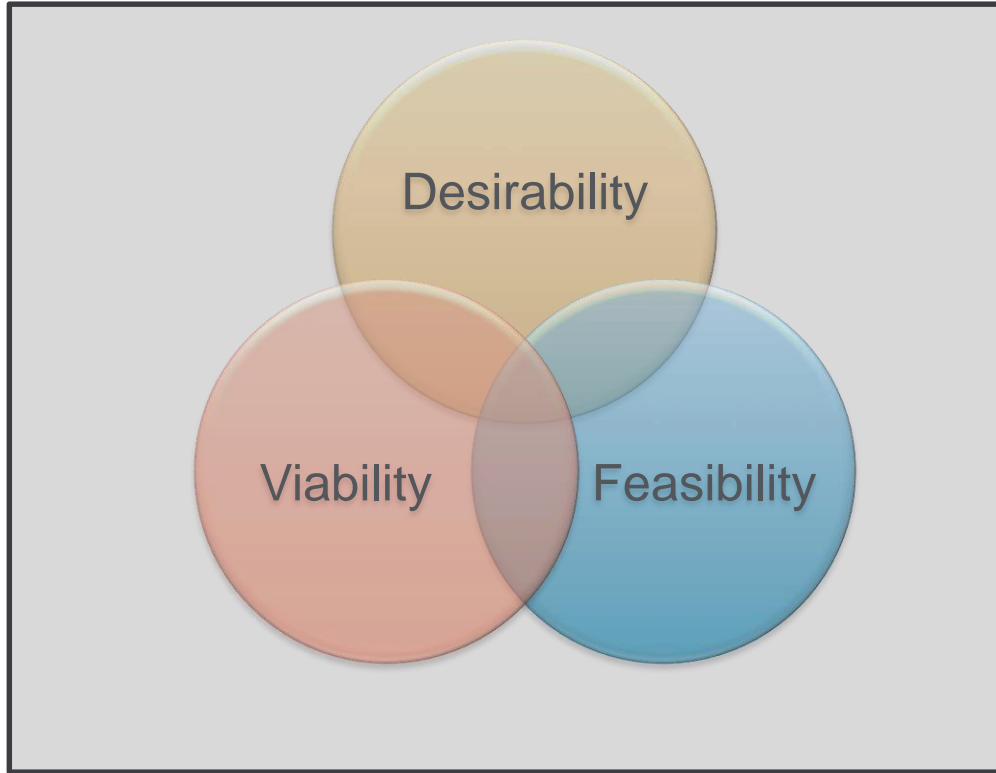
- Patient-focused
- Provider-focused
- Education
- Feedback/Reminders
- Patient safety
- Organizational change
- Economic strategies
- Policy/Regulation
- Multifaceted

# DESIGN THINKING

Designer's sensibility and methods to match:

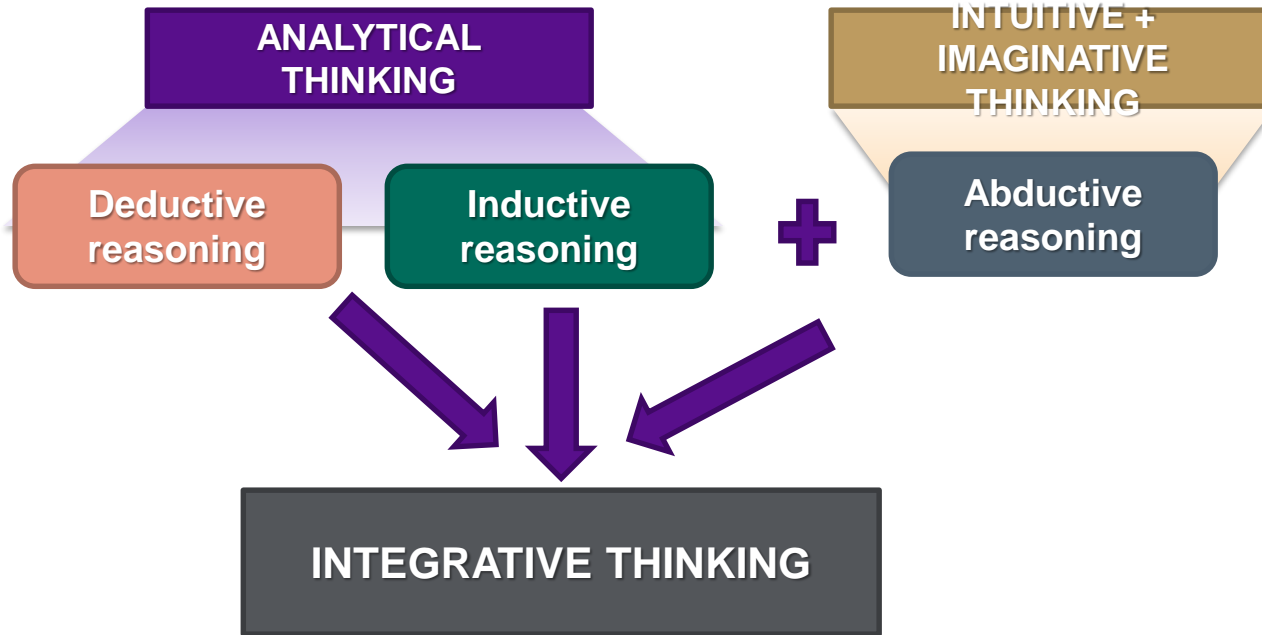
- Desirability (people's needs)
- Feasibility (social, political, technological, cultural)
- Viability (economic, sustainable, scalable)

# Designer's Triad





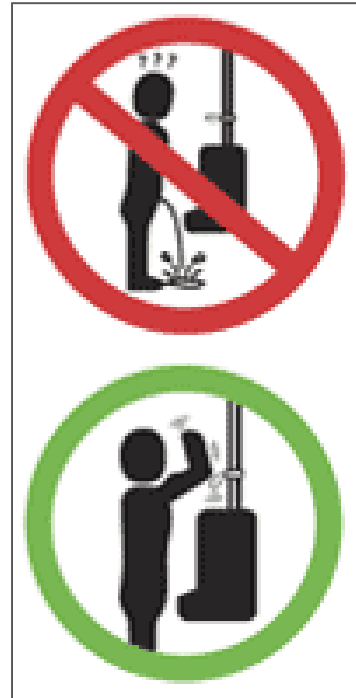
# Designer's Sensibility: Integrative Thinking





**Please do not pee  
everywhere. Keep the  
bathroom clean for  
next use.**

**Thanks,  
Bayanihan Management**





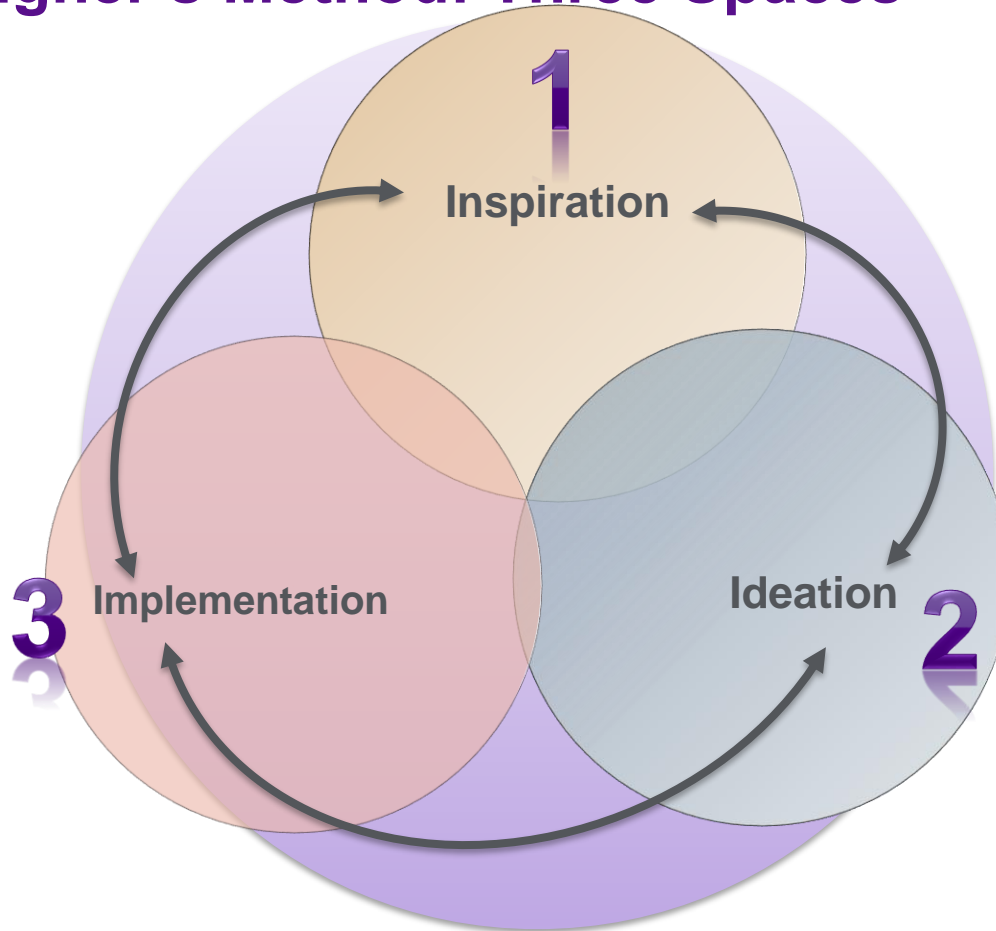
**Reduces  
spillage  
by over  
80%!**

# How can we get more people to use stairs?





# Designer's Method: Three Spaces



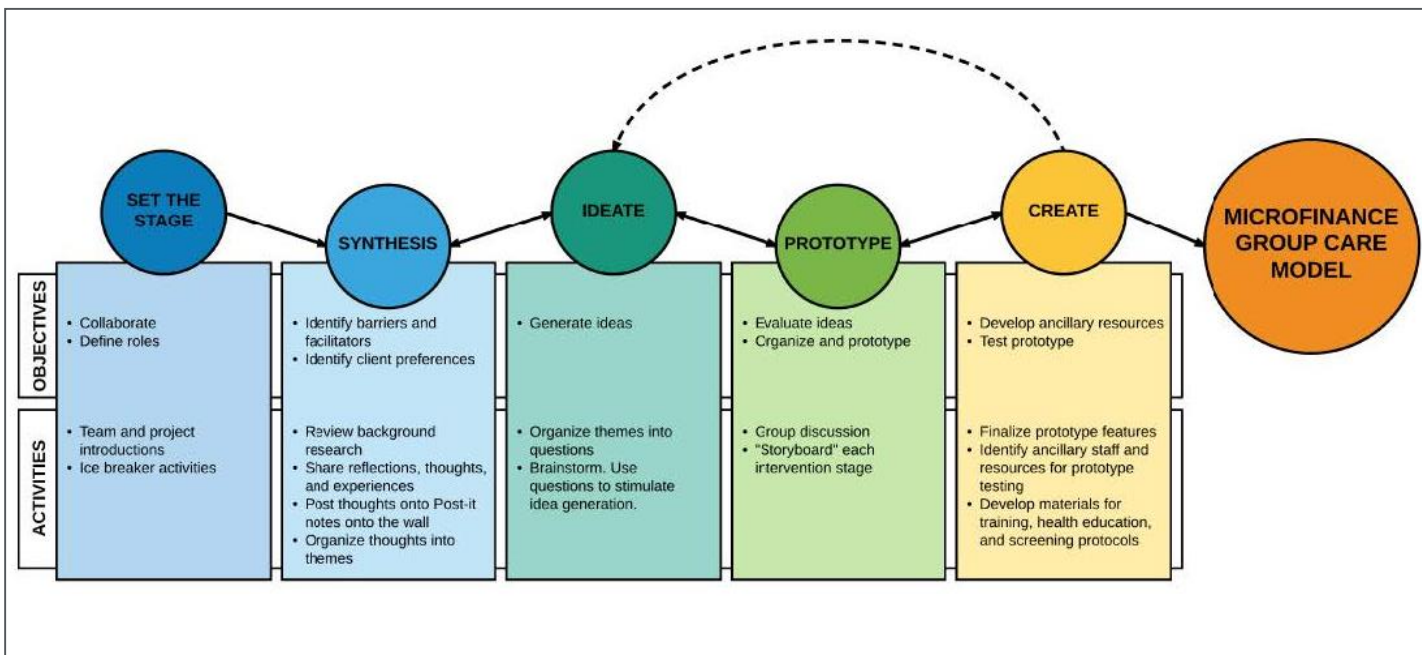


# Bridging Income Generation with Group Integrated Care

PI (USA): Rajesh Vedanthan, MD MPH

PI (Kenya): Jemima H. Kamano, MMed





# Design Team



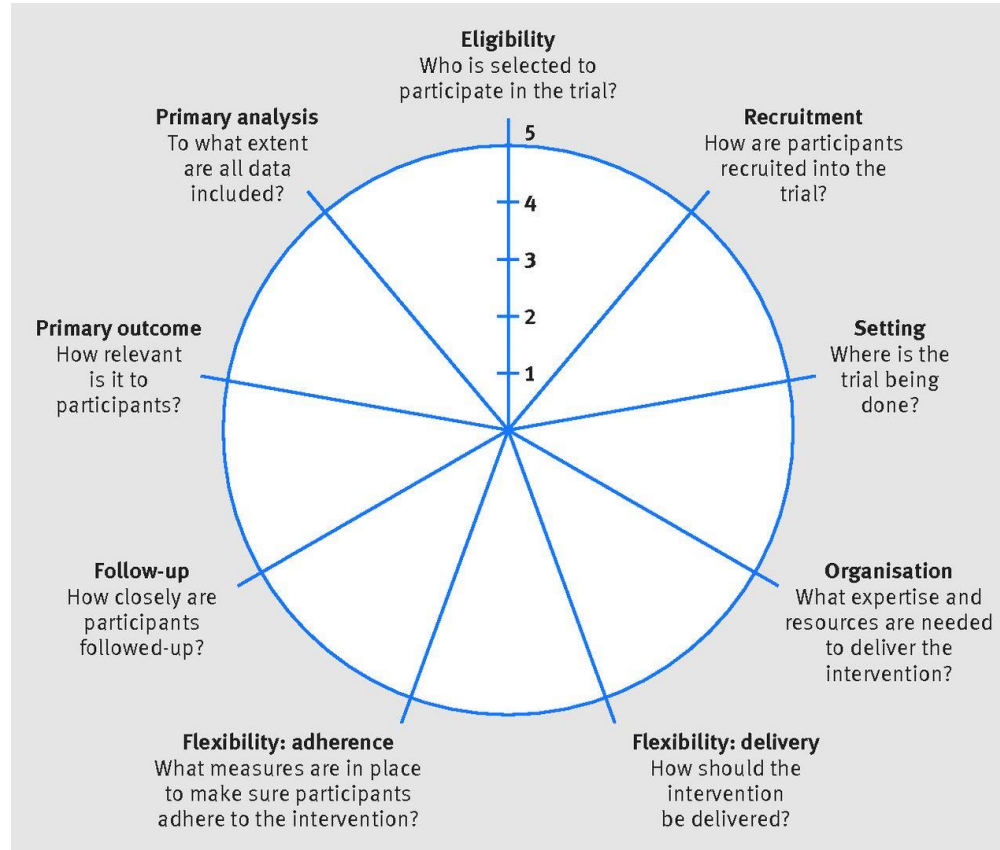
# Aim 1.1: Prototype



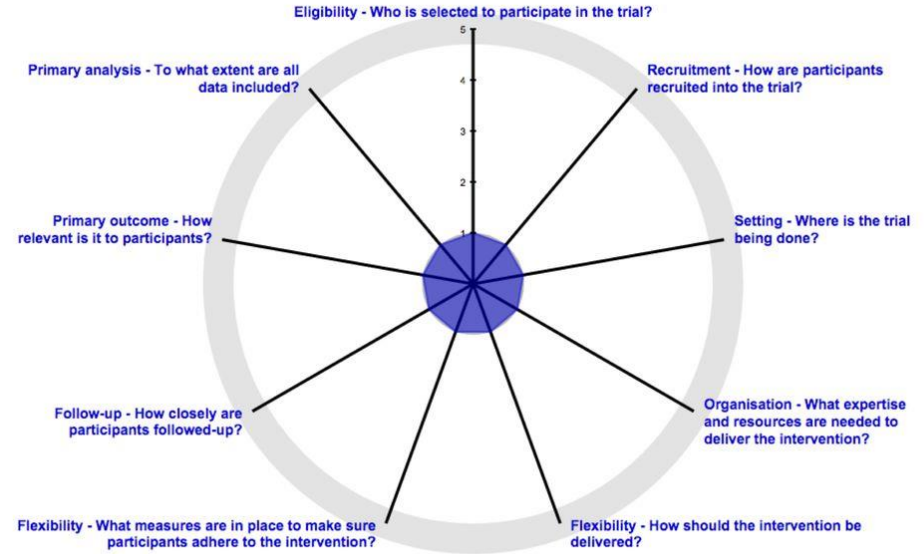
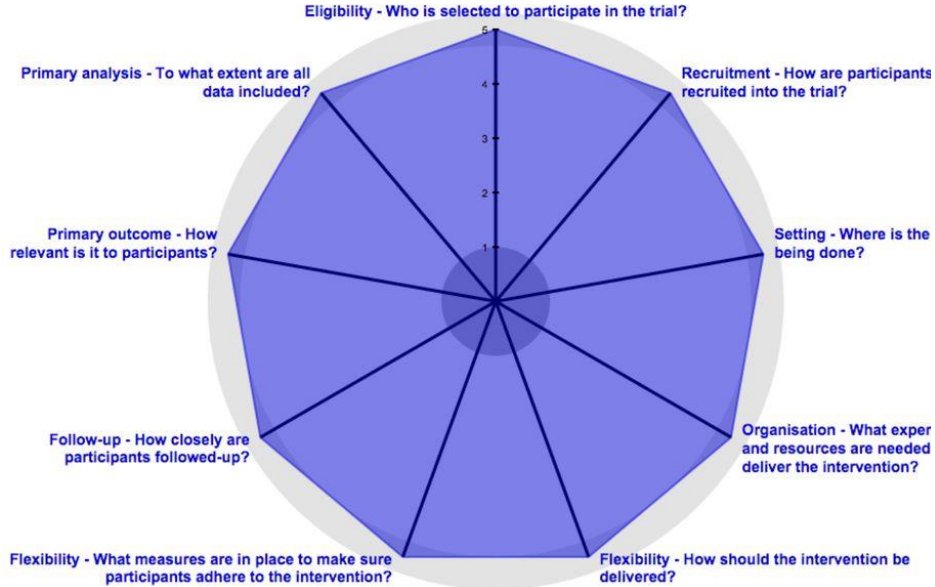
# Implementation Research



# The PRagmatic-Explanatory Continuum Indicator Summary 2 (PRECIS-2) wheel



# Pragmatic vs. Explanatory





# Pragmatic vs. Traditional

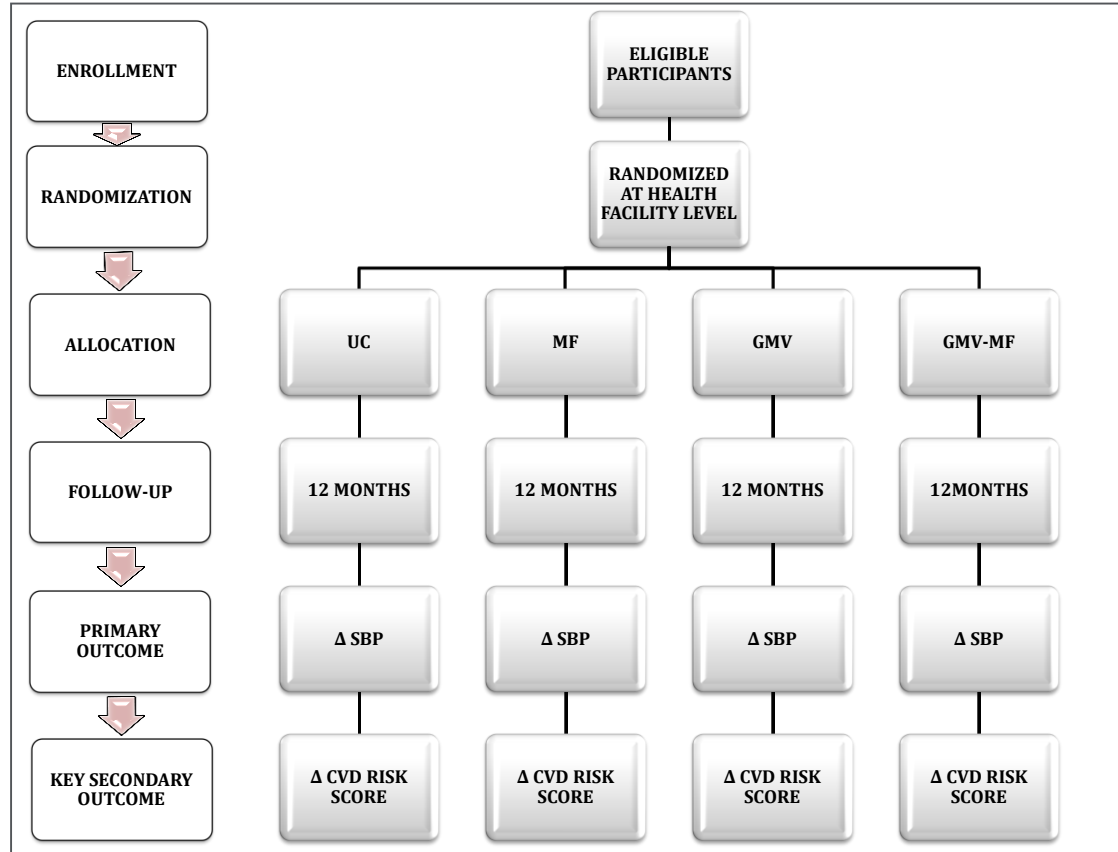
	<u>Pragmatic</u>	<u>Traditional</u>
Stakeholder Engagement	Engaged in all phases	Limited engagement
Research Design	Internal and external validity; design fidelity; local adaptation; real-life settings; context	Limiting threats to internal validity; usually RCT; homogenous participants
Outcomes	Reach, effectiveness, adoption, implementation, comparative effectiveness, sustainability	Efficacy, mechanism, component analysis
Measures	Brief, valid, actionable, rapid utility, feasible	Validated measures that minimize bias; internal consistency/theory vs. clinical relevance
Data Source	Existing data, health records, admin data, patient reports	Data generation and collection part of clinical trial
Availability of Findings	Rapid learning and implementation	Delay between trial completion and analytic availability

# Pragmatic vs. Traditional

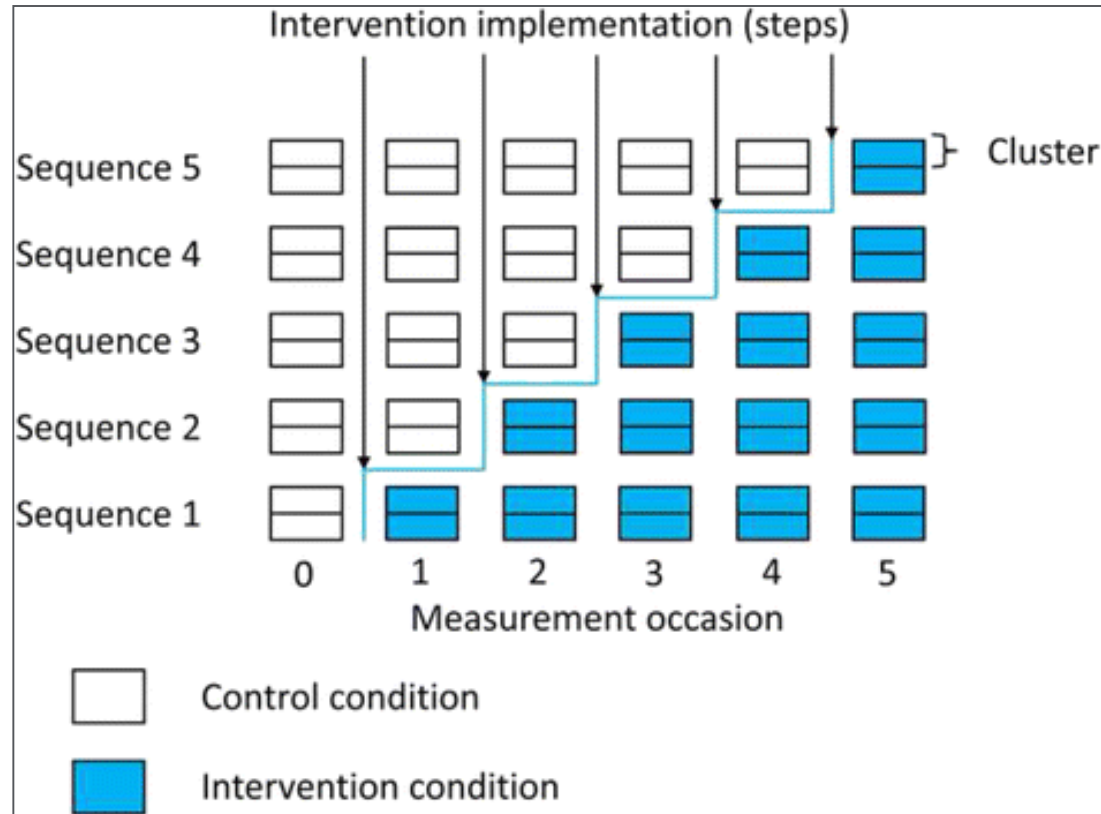
<u>Pragmatic</u>	<u>Traditional</u>
Few exclusion criteria; higher external validity	More exclusion criteria; lower external validity
Wide range of patients, providers, and settings	Limited range of patients, providers, and settings
Active comparators	Mostly placebo-controlled
Patient-centered outcome measures	Clinical or physiological outcome measures
Longer follow-up with less intensity	Shorter follow-up with more intensity
Often not blinded	Often double-blinded
Often cluster-randomized	Often individual-randomized



# BIGPIC: Cluster RCT



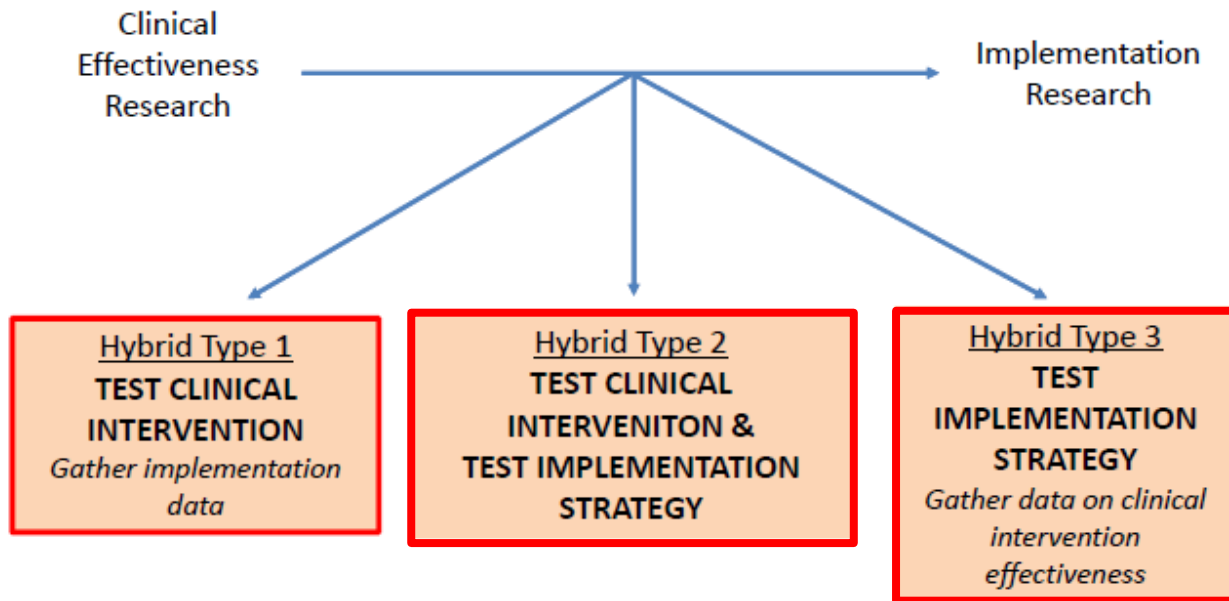
# Stepped-Wedge Design



# Implementation Research



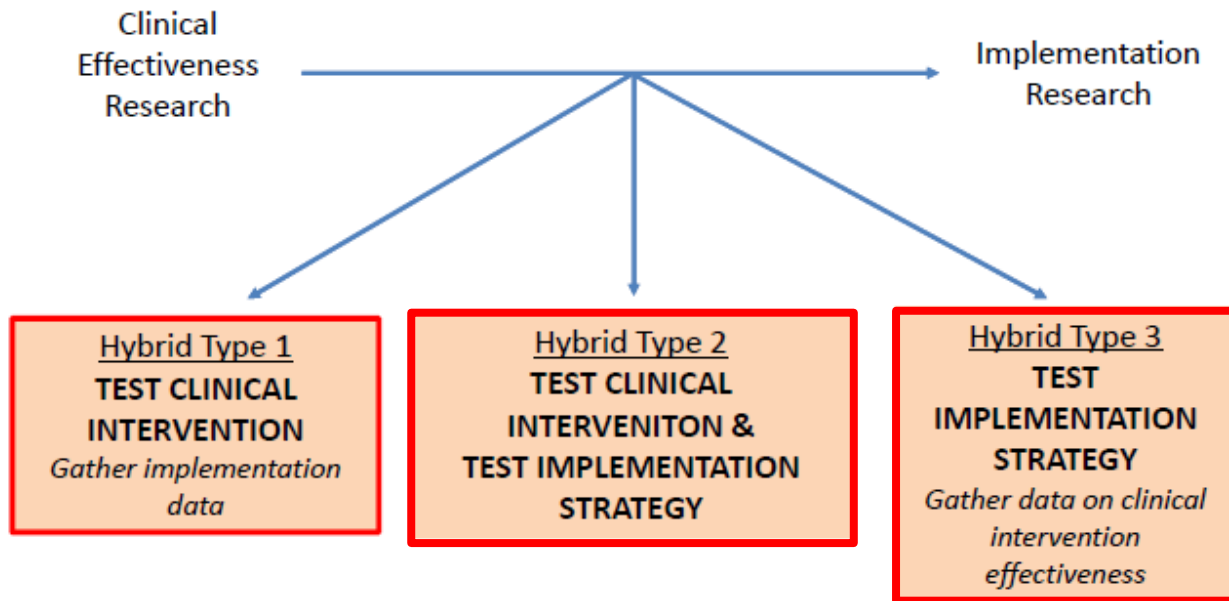
## Differences between hybrid designs 1, 2 and 3



# Hybrid Type 1

- Research Aim:
  - Primary: Effectiveness of intervention
  - Secondary: Better understand context for implementation
- Sample Research Question
  - Primary: Will treatment work in this setting/with these patients
  - Secondary: What are potential barriers/facilitators to widespread implementation

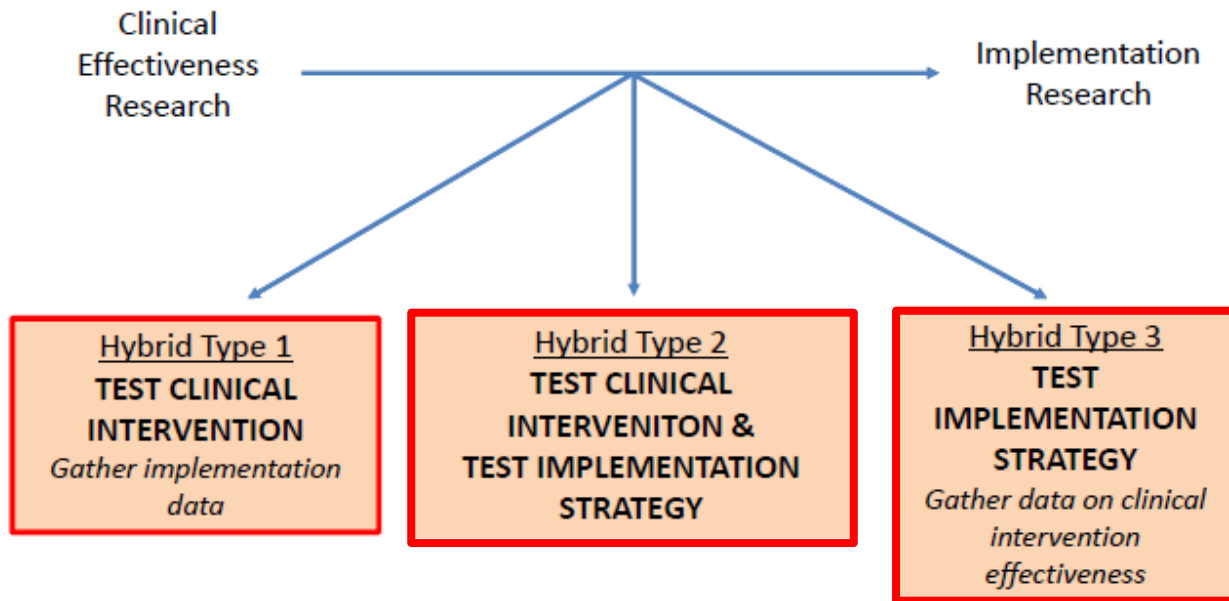
## Differences between hybrid designs 1, 2 and 3



## Hybrid Type 2

- Research Aim:
  - Co-Primary (“clinical”): Effectiveness of intervention
  - Co-Primary (“implementation”): Feasibility and potential utility of an implementation strategy
- Sample Research Question
  - Co-Primary: Will treatment work in this setting/with these patients
  - Co-Primary: Does the implementation method show promise in facilitating implementation of the clinical treatment

## Differences between hybrid designs 1, 2 and 3

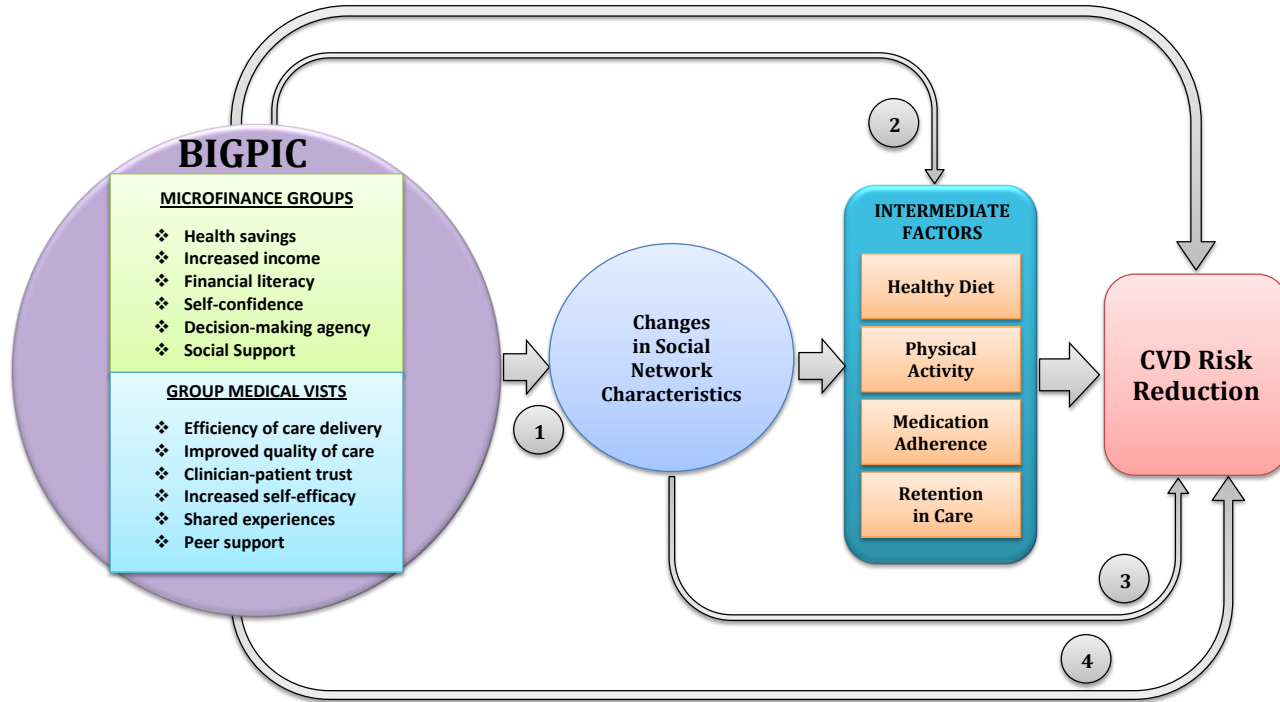




## Hybrid Type 3

- Research Aim:
  - Primary: Determine utility of an implementation strategy
  - Secondary: Assess clinical outcomes associated with implementation trial
- Sample Research Question
  - Primary: Which method works better in facilitating implementation of a clinical treatment
  - Secondary: Are clinical outcomes acceptable?

# BIGPIC—Type 2



# Process evaluation

thebmj

Research ▾ Education ▾ News & Views ▾ Campaigns ▾

## Research Methods & Reporting

### Process evaluation of complex interventions: Medical Research Council guidance

BMJ 2015 ; 350 doi: <https://doi.org/10.1136/bmj.h1258> (Published 19 March 2015)

Cite this as: BMJ 2015;350:h1258

#### Context

Contextual factors that shape theories of how the intervention works  
Contextual factors that affect (and may be affected by) implementation, intervention mechanisms and outcomes  
Causal mechanisms present within the context which act to sustain the status quo, or potentiate effects

#### Description of intervention and its causal assumptions

#### Implementation

Implementation process (How delivery is achieved; training, resources etc)  
What is delivered  
Fidelity  
Dose  
Adaptations  
Reach

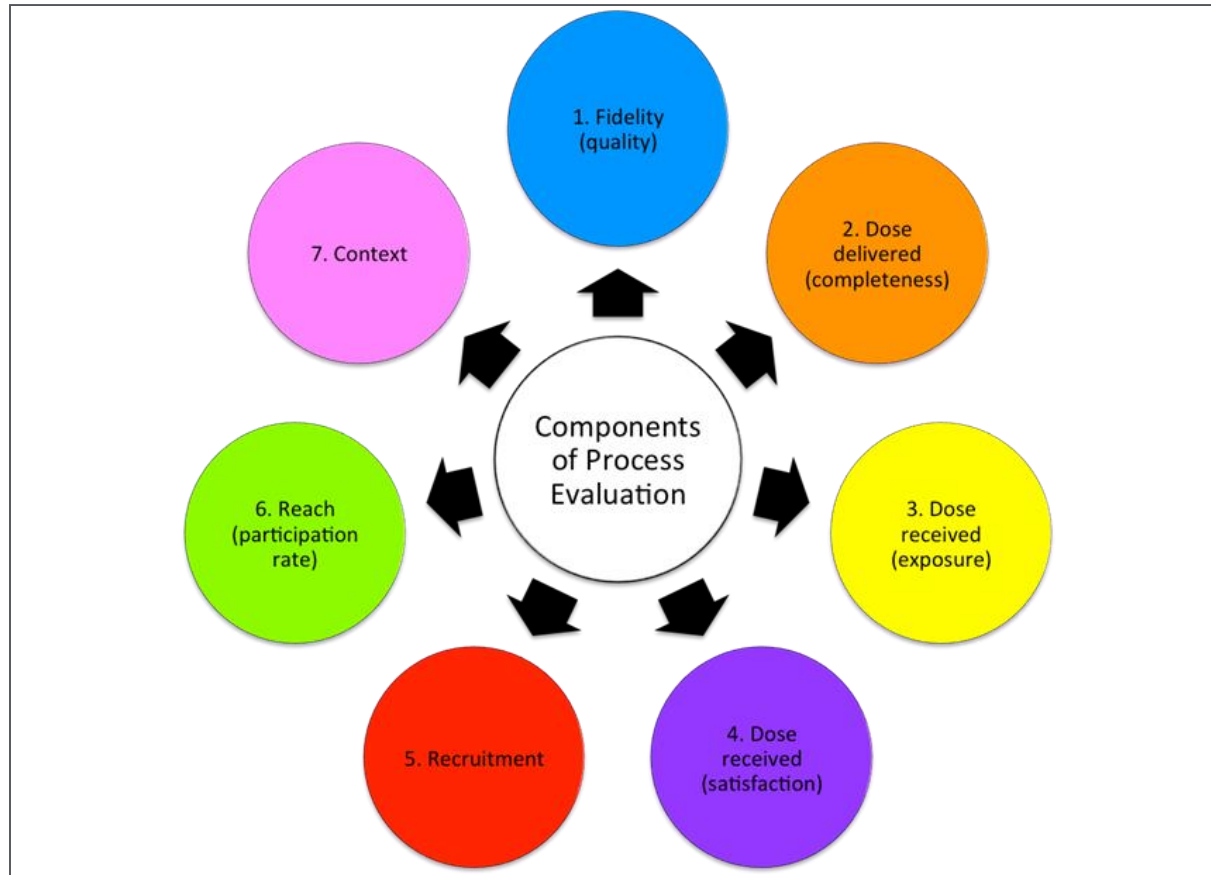
#### Mechanisms of impact

Participant responses to and interactions with the intervention  
Mediators  
Unexpected pathways and consequences

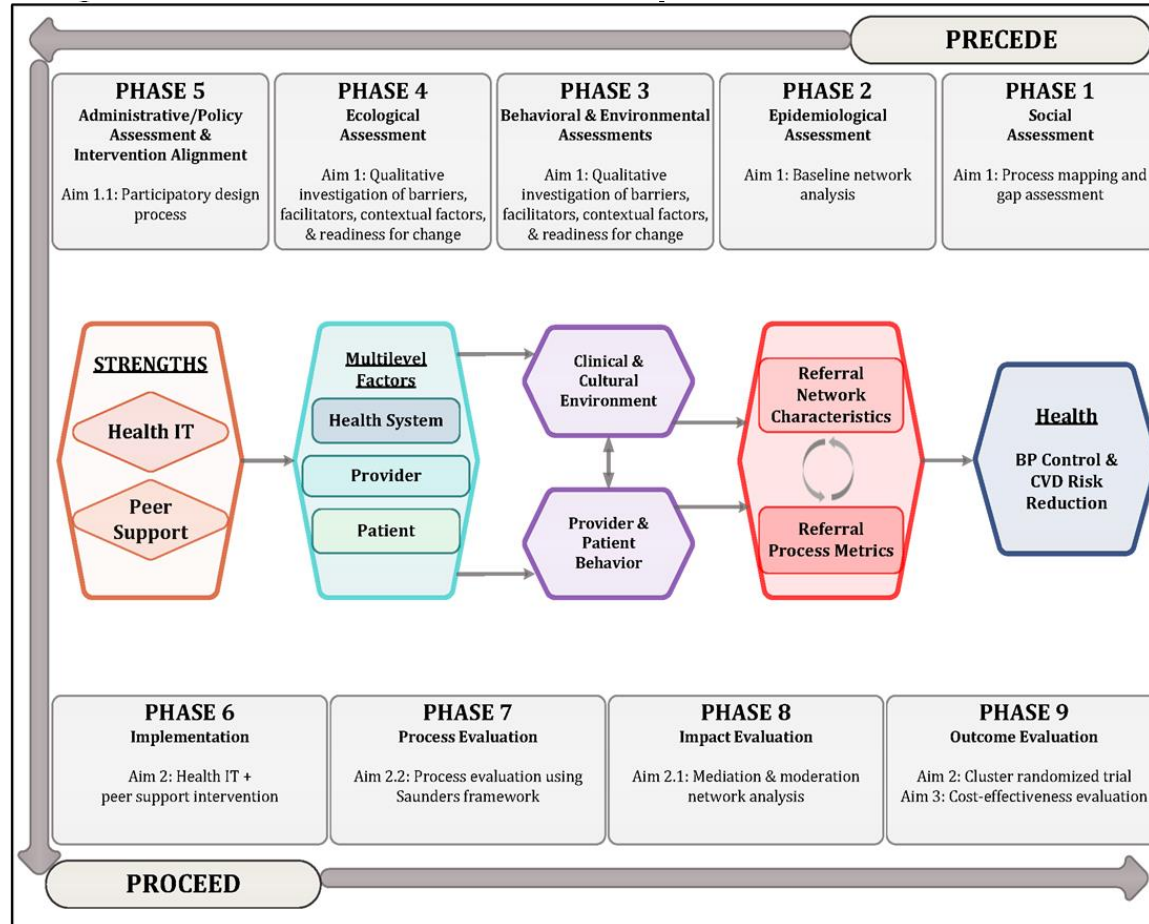
#### Outcomes



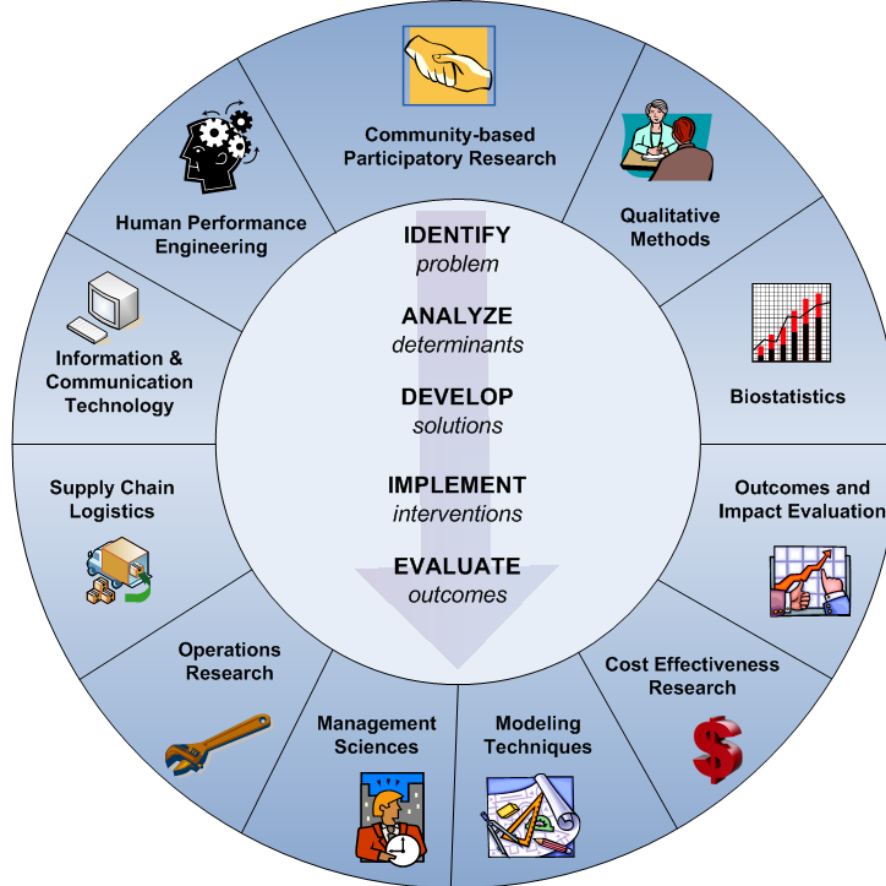
# Process Evaluation: Saunders



# Putting It All Together



# Implementation Research







**THANK YOU**

# **Small Group Session to Discuss Research Projects**

- 60 minutes for group discussion
- 15 minutes feedback & discussion to plenary group

# Tasks in the group

- Choose 1 person to 'chair'/facilitate the group and 1 person to identify and briefly report back on up to 3 learnings from each group.
- At least one faculty will visit and spend time with your group.
- Many of you have submitted an abstract for an implementation project, so each of you will have approximately 10 minutes to present and discuss your project.
- After each presentation (3 min.), discuss the key questions on the following slide (7 min.)

# Discuss for each project

- What is the implementation problem or gap that is being addressed? How do you know this?
- What are the planned implementation strategies? How do you know this?
- How are/will you evaluate whether your strategies are effective? Measures + Study Design?

# WHO Guide – Framework Model

## Relationship between implementation and the implementation research cycle

