Implementing Improvements: Advancing Quality Improvement with Implementation Science

Amy Tyler, MD, MSCS

Objectives

- Identify ways Quality Improvement Science and Implementation Science are the same
- Identify ways Quality Improvement Science and Implementation Science are different
- Name three ways you can integrate Implementation Science and Quality Improvement Science in your next project

Has this ever happened to you?

Has this ever happened to you?

Has this ever happened to you?

Definitions

Implementation Science

The study of methods to promote the integration of research findings and evidence into healthcare policy and practice. – NIH

Quality Improvement Science

An applied science that emphasizes innovation, rapid-cycle testing in the field, and spread in order to generate learning about what changes, in which contexts, produce improvements. – IHI

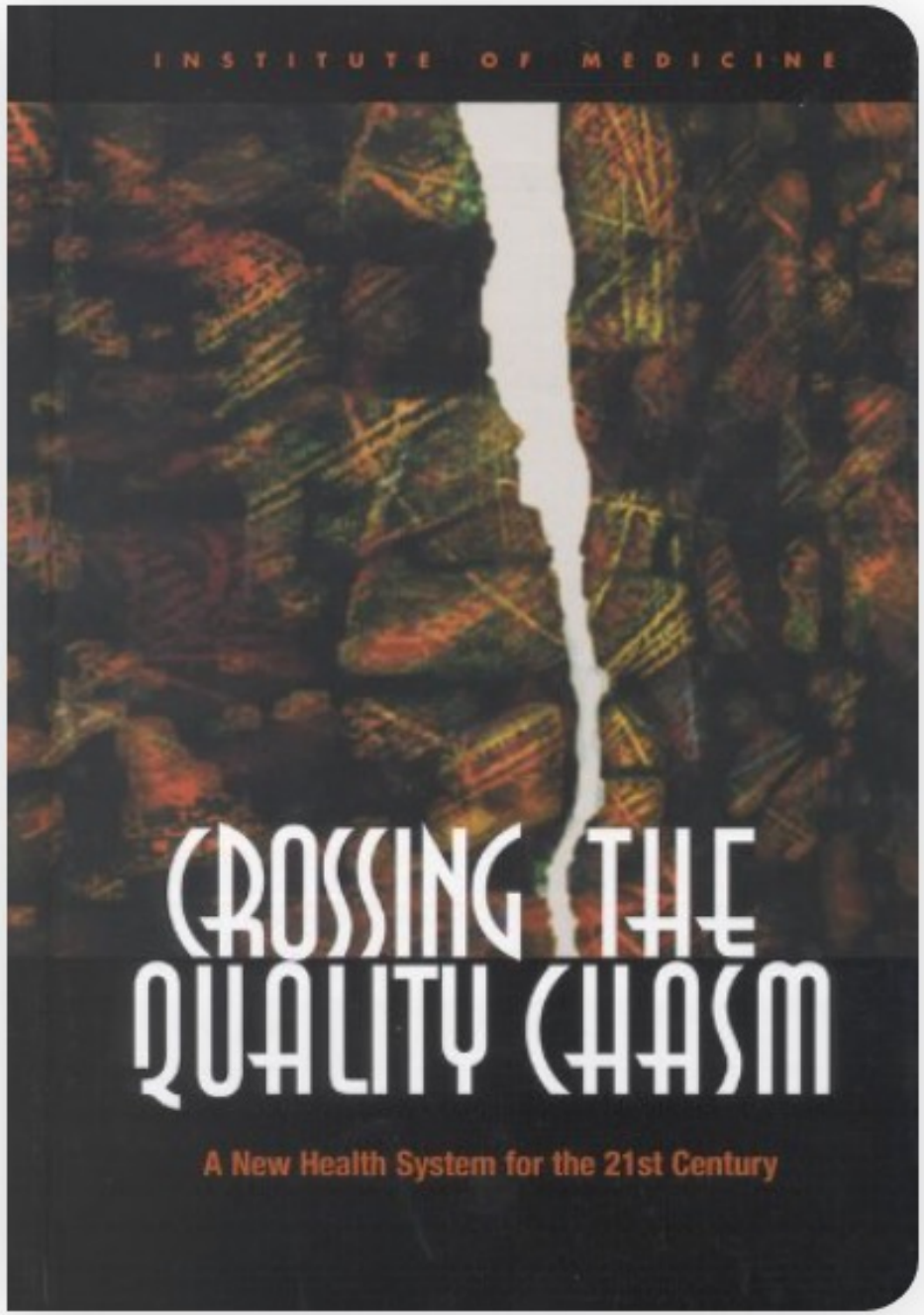
Focus

Implementation Science Focus:

Developing approaches to close the gap between what is known (research findings) and what is practiced (by clinicians).

Quality Improvement Science Focus:

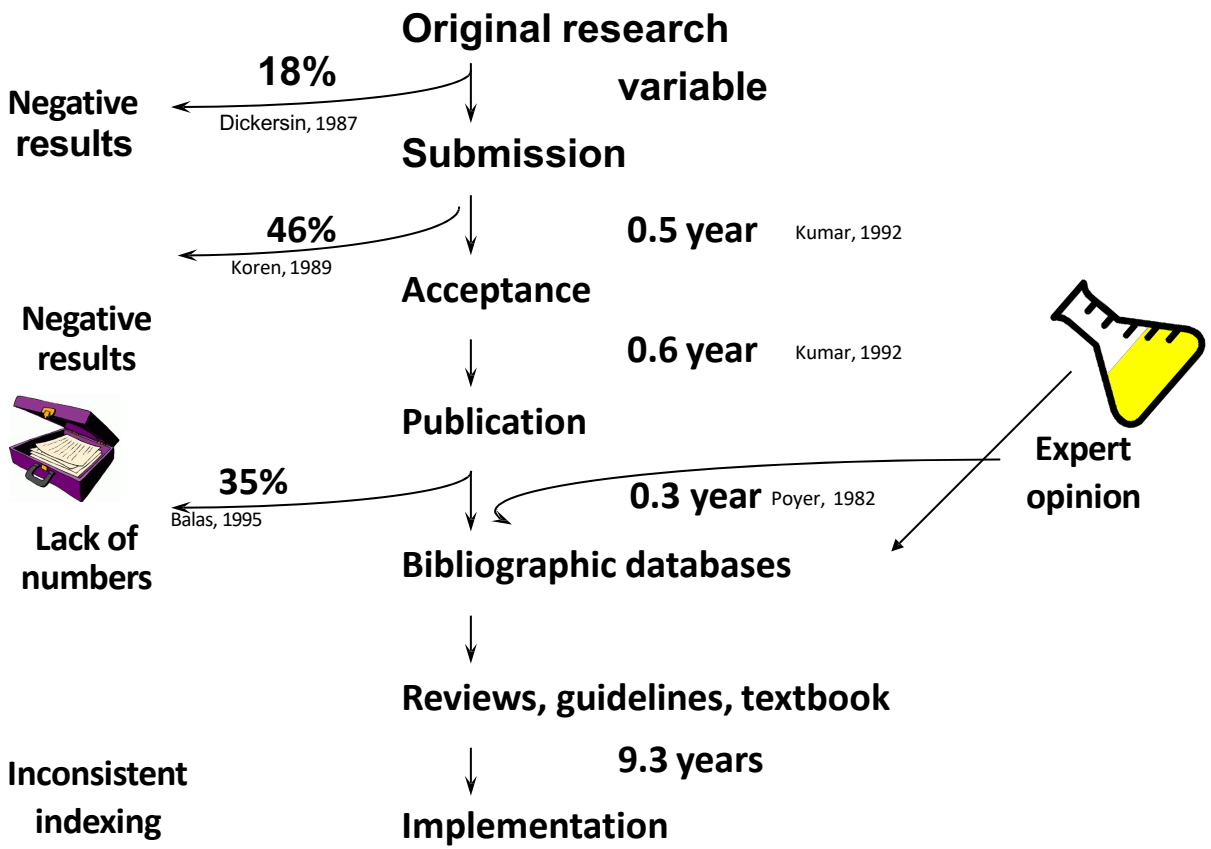
Transforming systems of care to improve healthcare quality and delivery



Why Quality improvement science?

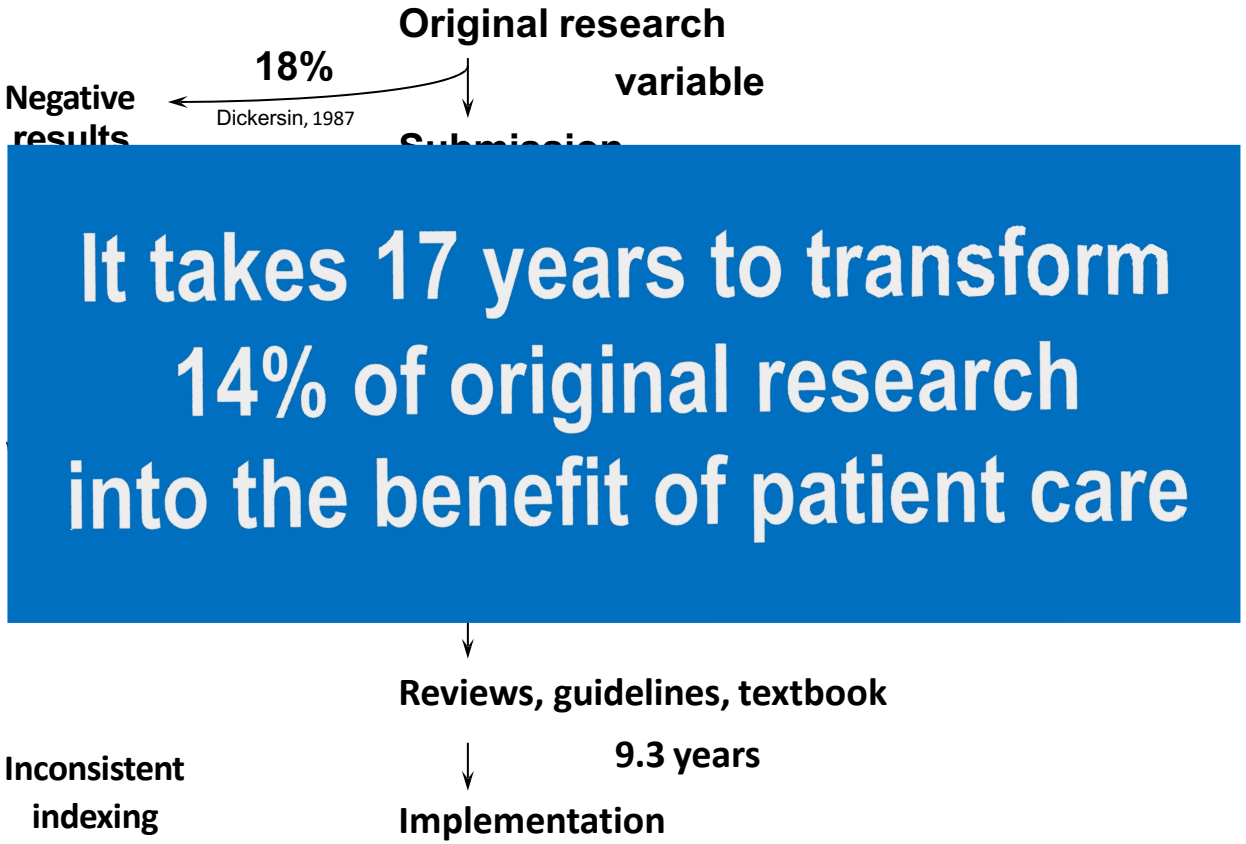
- Safety
- Timeliness
- Effectiveness
- Efficiency
- Equity
- Patient-centeredness

Why Implementation Science?



Bales & Boren, 2000

Why Implementation Science?



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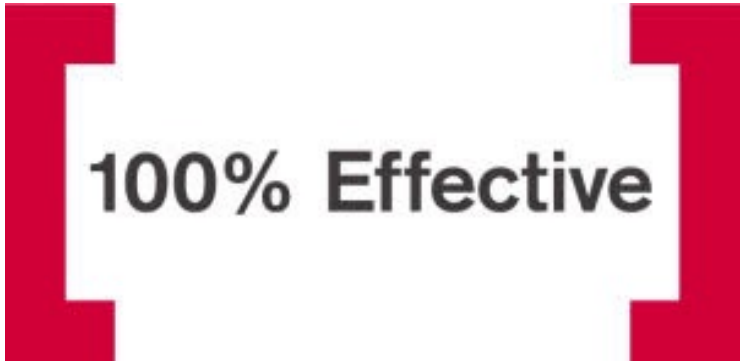


- It is adopted
- Clinicians are trained to deliver it
- Trained clinicians choose to deliver it
- Eligible populations receive it
- It is sustained

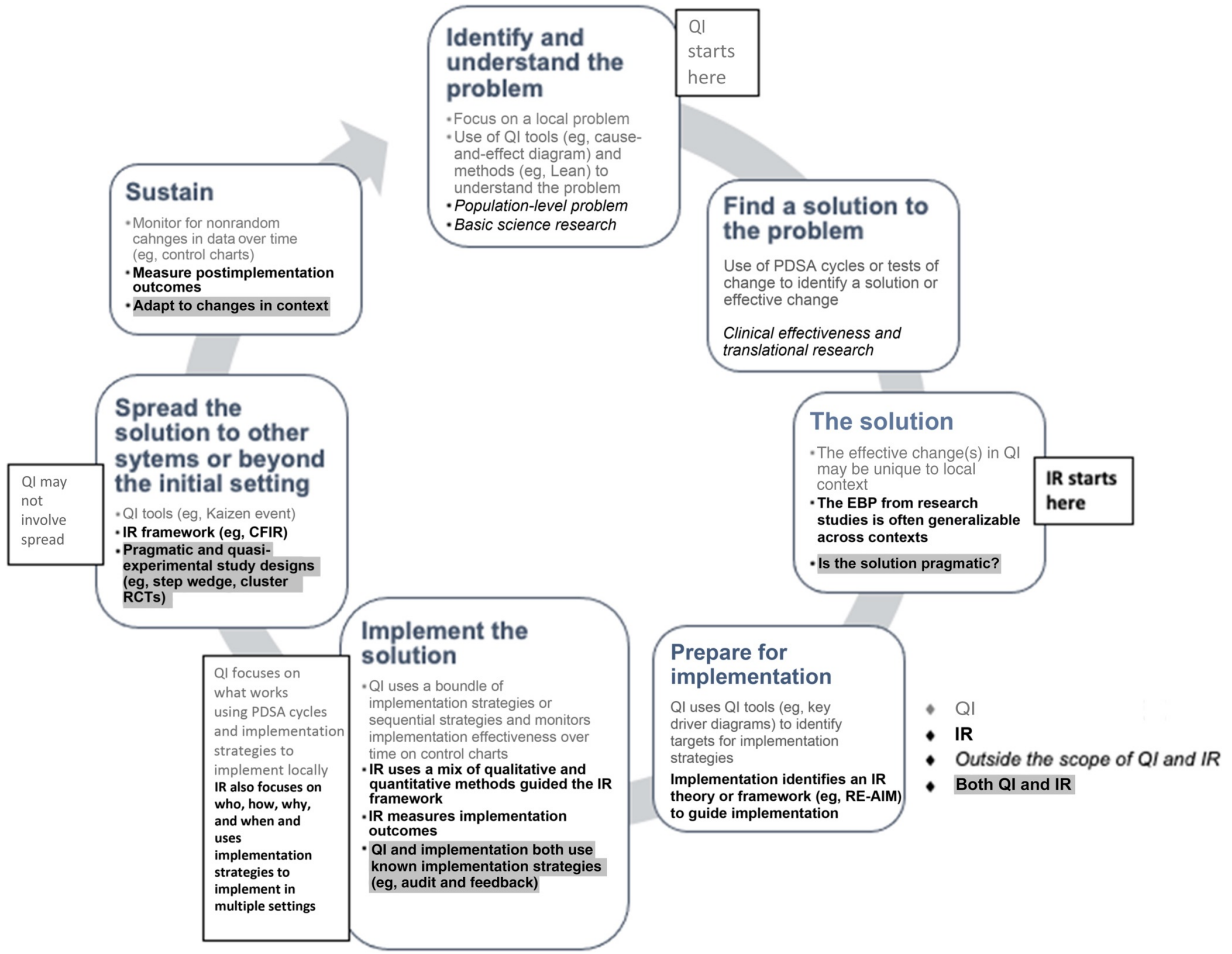
If we assume 50% at each step…

0.5 x 0.5. 0.5 x 0.5 x 0.5 = 3% benefit

Glasgow RE, 1999

Quality Improvement (QI) + Implementation Research (IR)

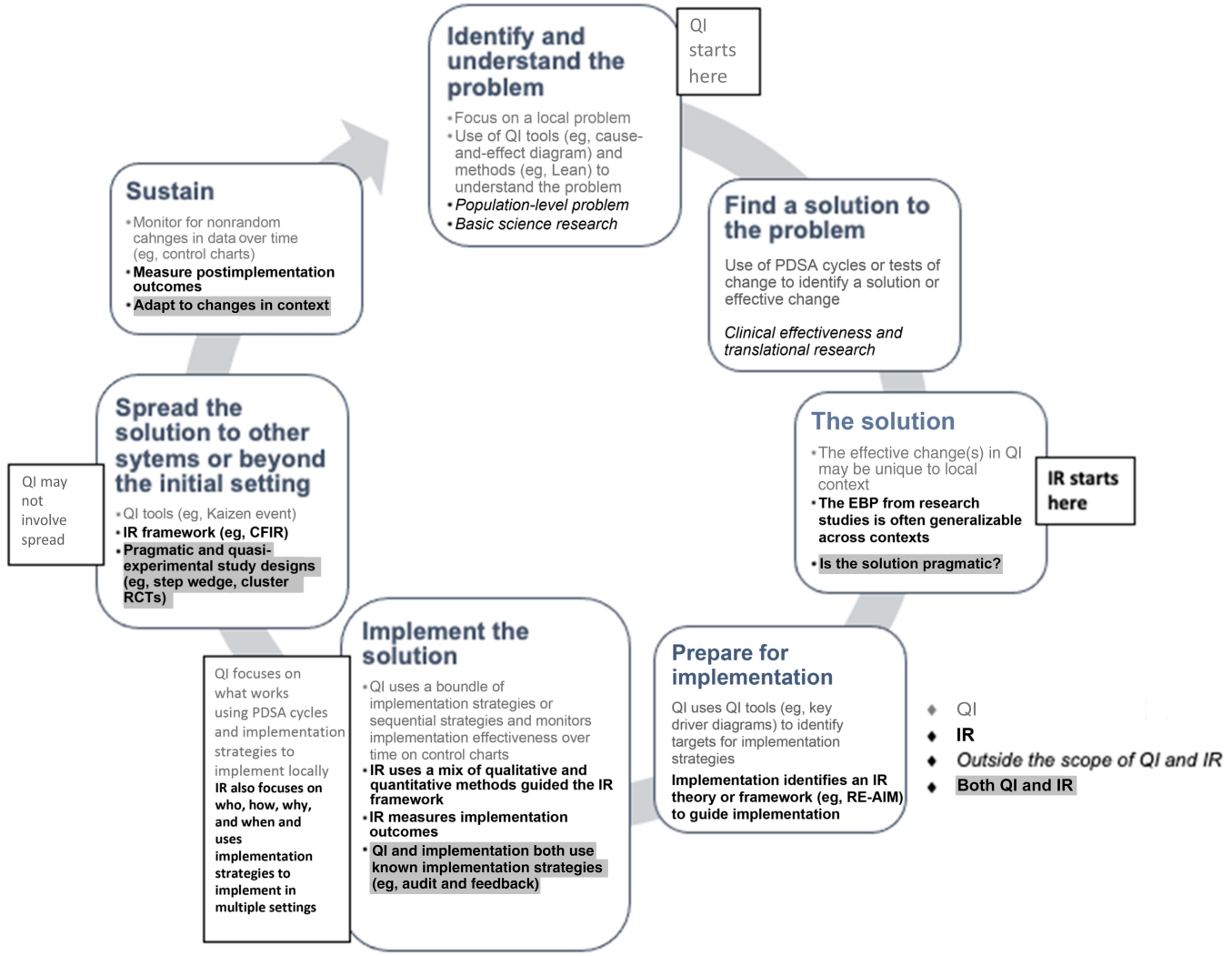
- Starting Point
  - Local problem (QI)
  - Evidence based practice (IR)



Quality Improvement (QI) + Implementation Research (IR)

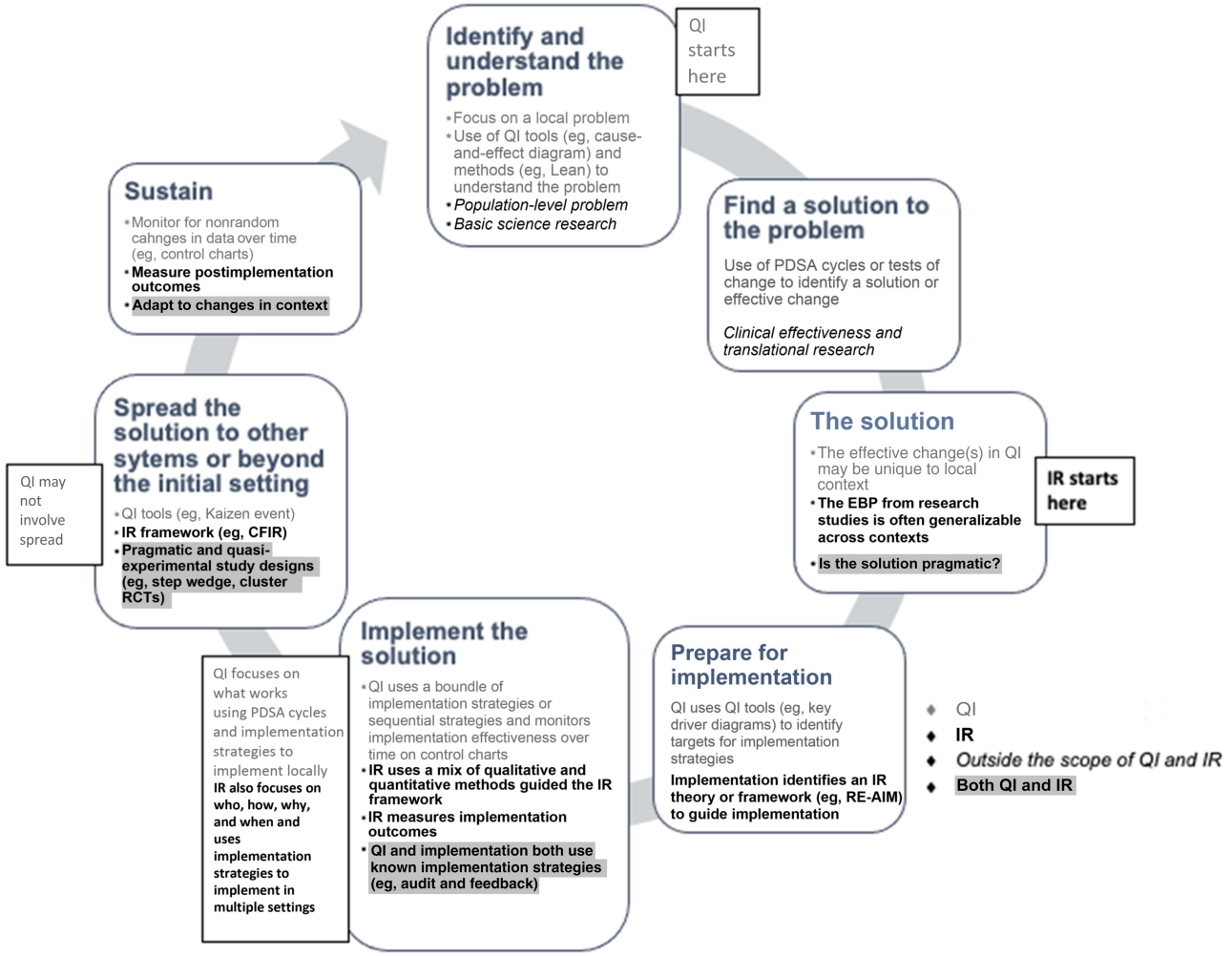
- Starting Point
  - Local problem (QI)
  - Evidence based practice (IR)

- Methods/Tools
  - Understand problem and test solutions (QI)
  - Understand barriers to implementation and test strategies (IR)

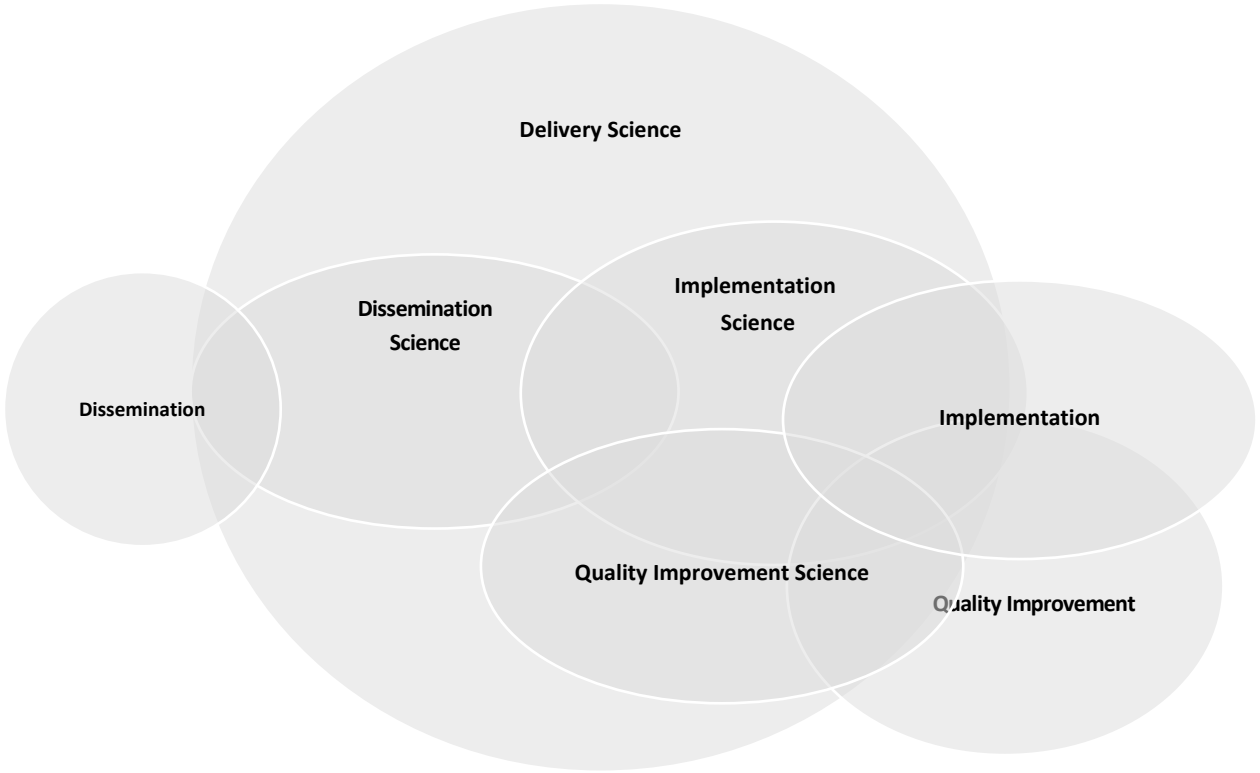


Quality Improvement (QI) + Implementation Research (IR)

- Starting Point
  - Local problem
  - Evidence based practice
- Methods/Tools
  - Understand problem and test solutions (QI)
  - Understand barriers to implementation and test strategies (IR)
- Goals
  - Improve the problem, spread the intervention (QI)
  - Adapt EBP to context, understand why implementation works or not, produce generalizable knowledge (IR)



QI + Implementation Science



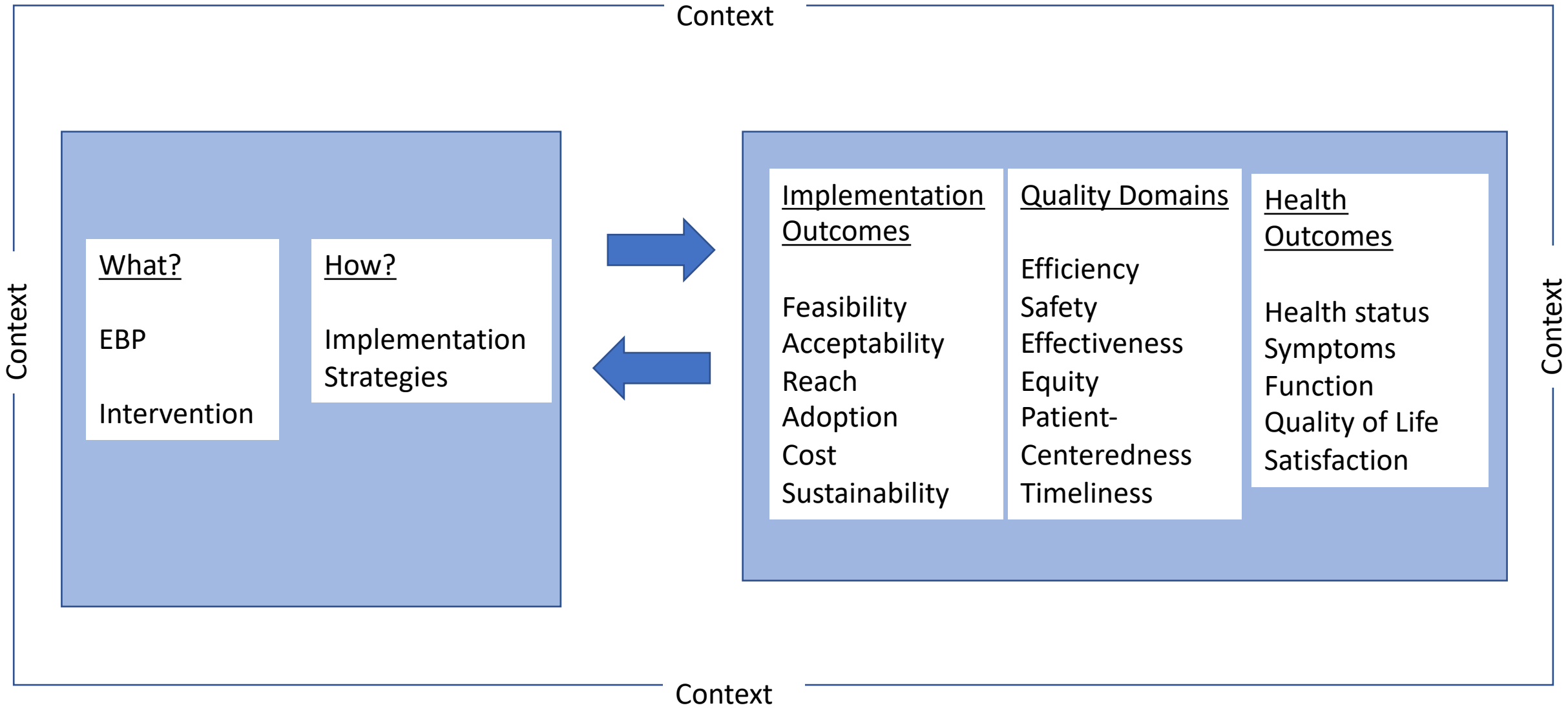
Tyler & Glasgow, 2021

Call to Action

1. Align Terminology
2. Share methods
3. Agree on publication standards
4. Collaborate in the design and conduct of studies
5. Collaborate between scholars and clinicians (implementers and improvers)
6. Educate professionals in both fields

Check, 2019
Koczwara, 2018

Delivery science Conceptual Model



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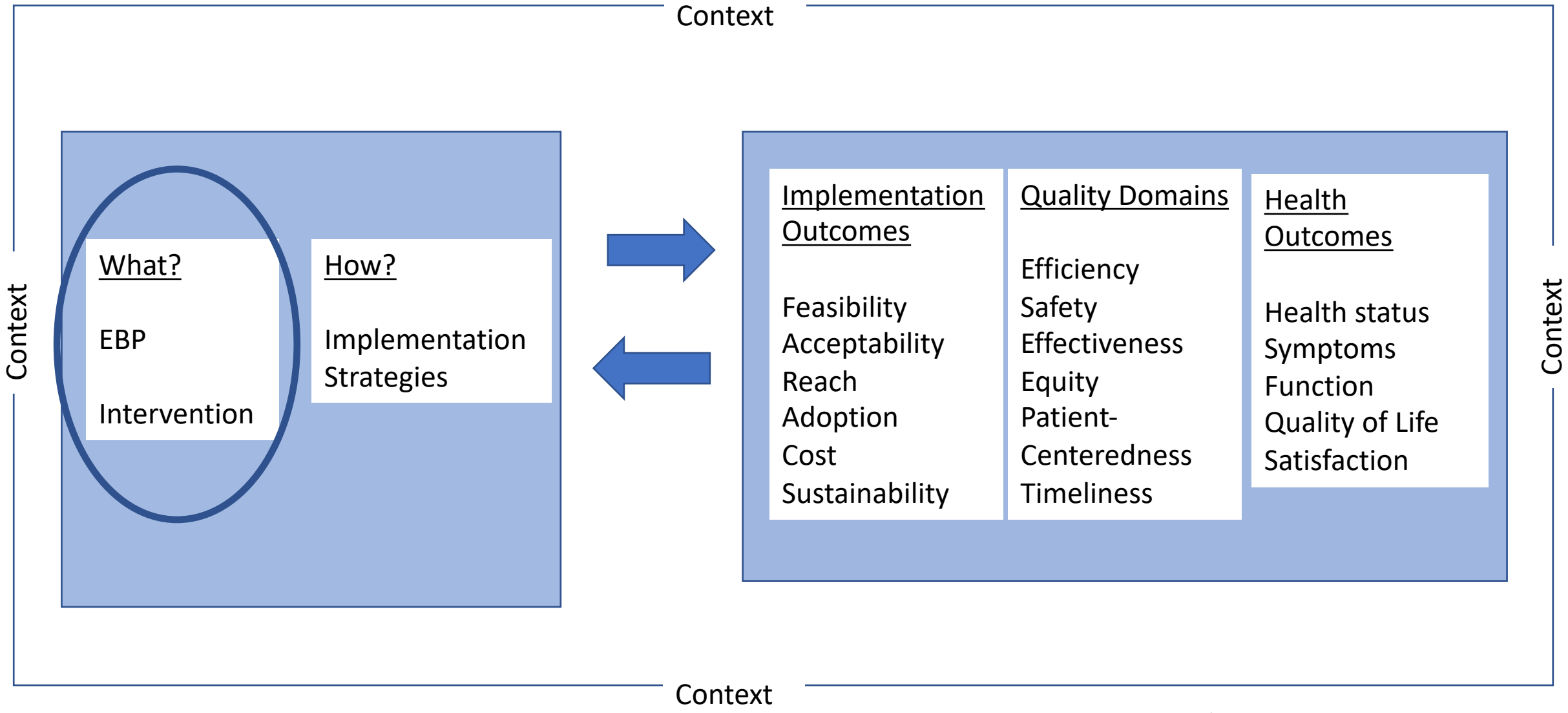
What are we trying Implement?



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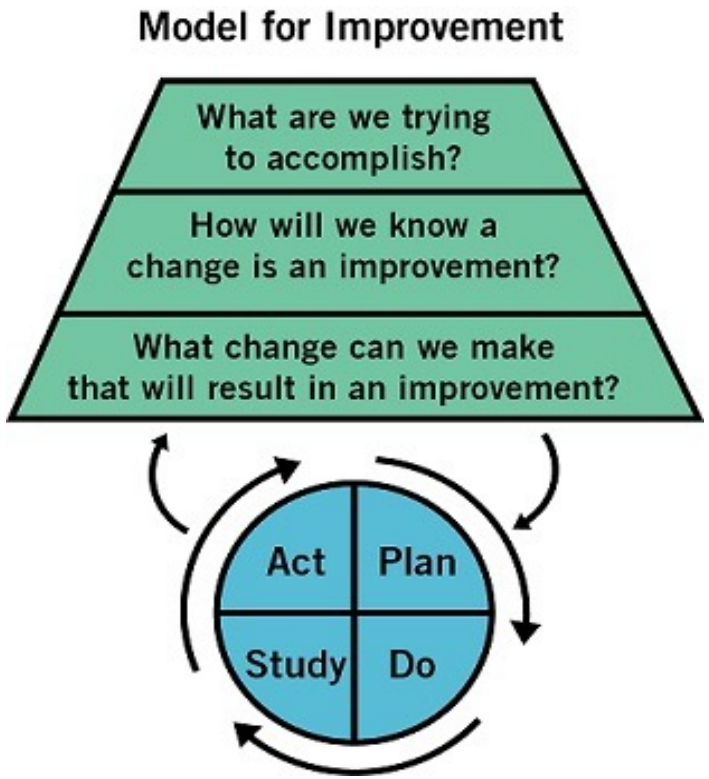
Model for improvement



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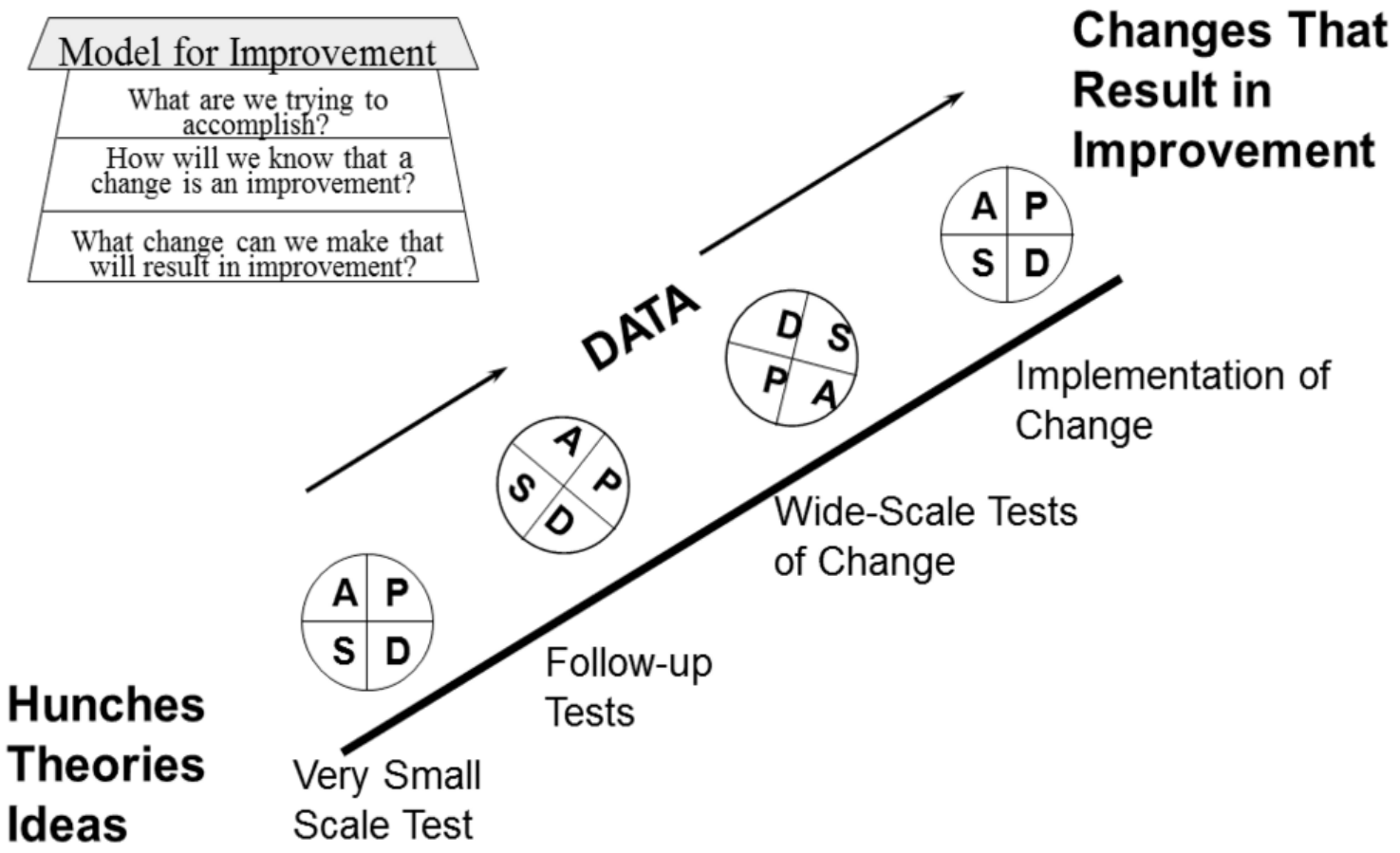
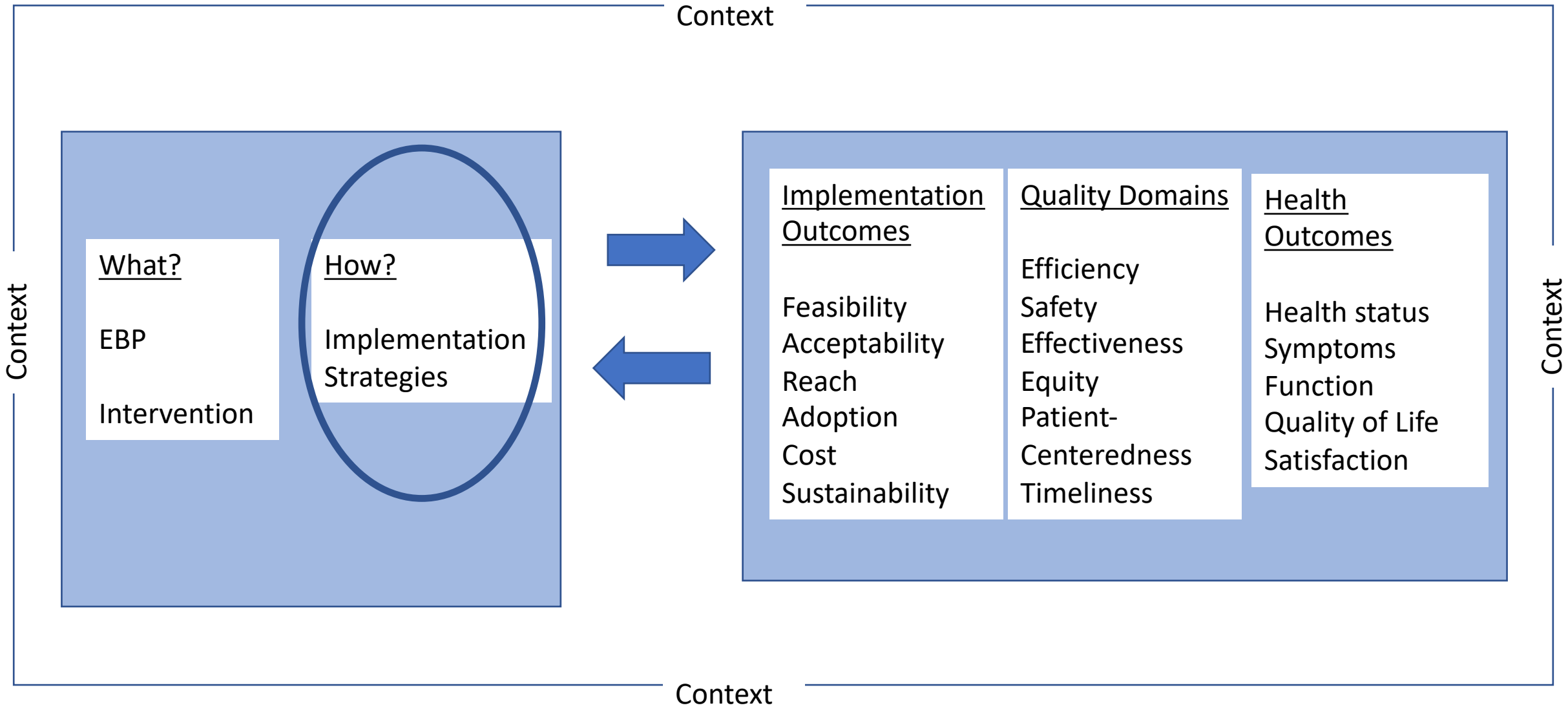


Evidenced Based Practice

Results of basic, clinical efficacy, effectiveness, and comparative effectiveness research

- Treatment guidelines
- Evidence-based treatments
- Evidence-Based practice/program
- Effective Quality improvement interventions

How do we implement?



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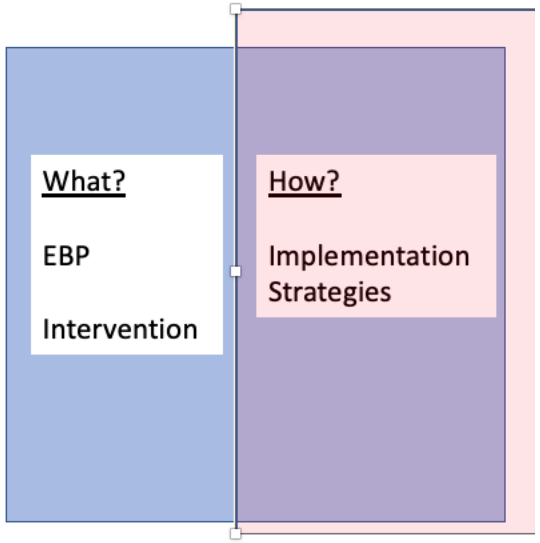
Selecting Implementation Strategies

Quality Improvement

- Interventions



Implementation Science

- What (EBP)
- How (Implementation Strategies)

Selecting Implementation Strategies

Quality Improvement

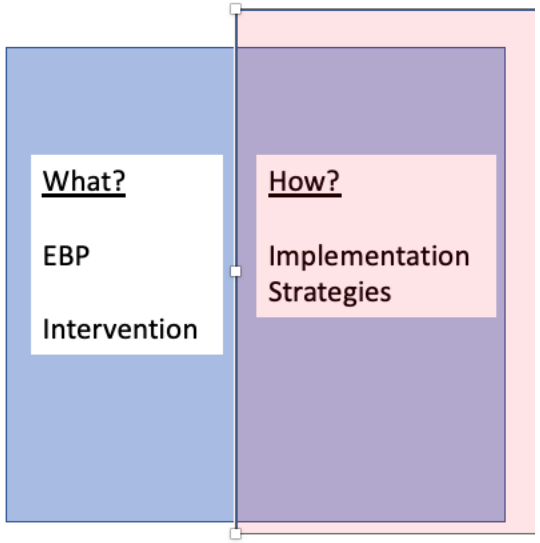
- Interventions

Discharge Checklist

Champions

Education

Clinical Decision support in EHR



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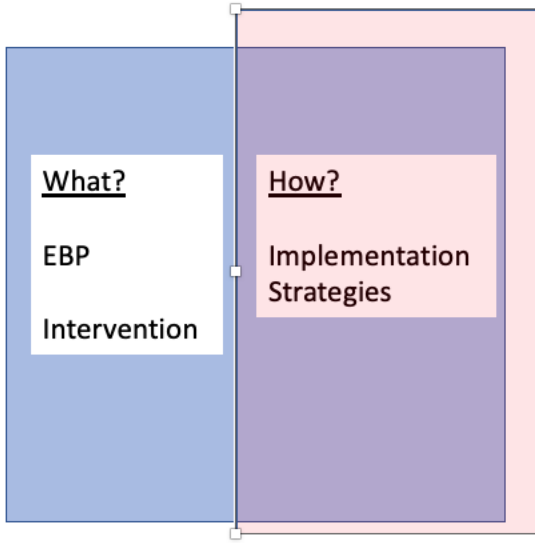

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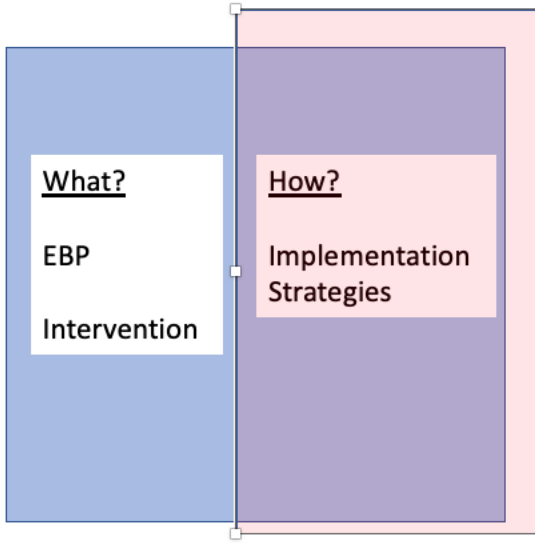

Implementation Science

- What (EBP)

Discharge Checklist

- How (Implementation Strategies)

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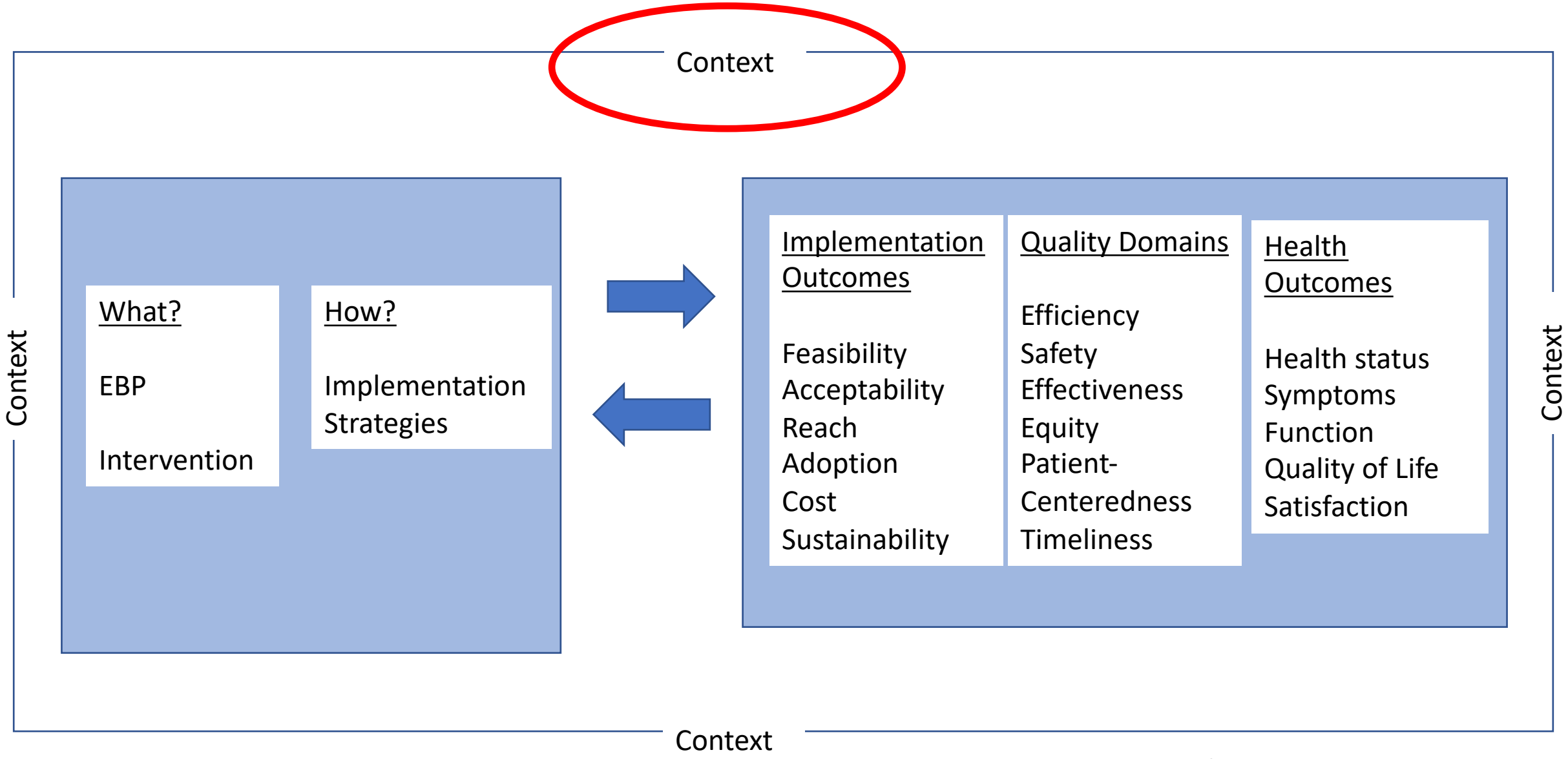
Clinical Decision support in EHR

Context Informs all phases of delivery science



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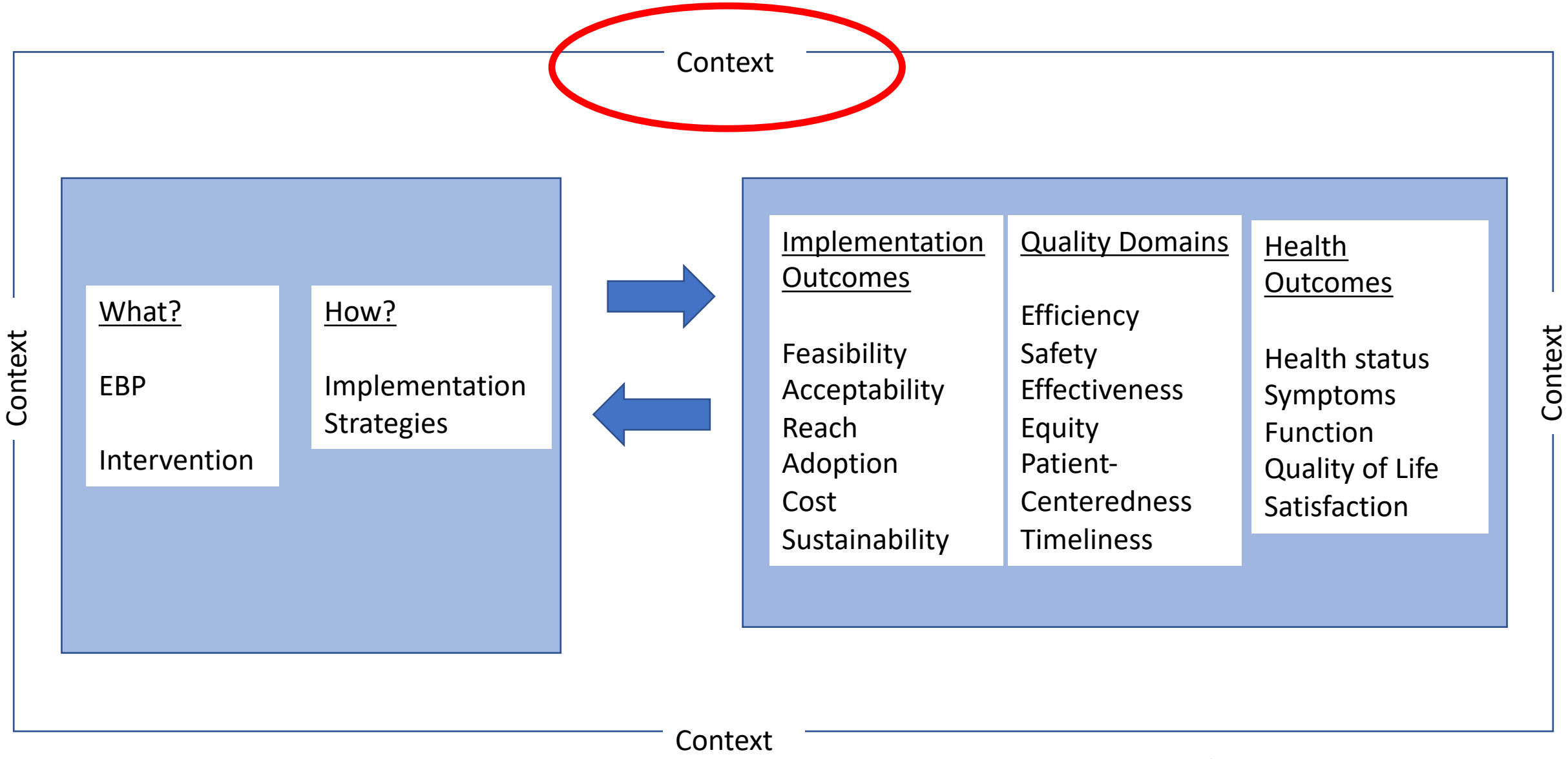
What is Context?

What is Context?

Systems, social norms, people and culture

How do we measure context?



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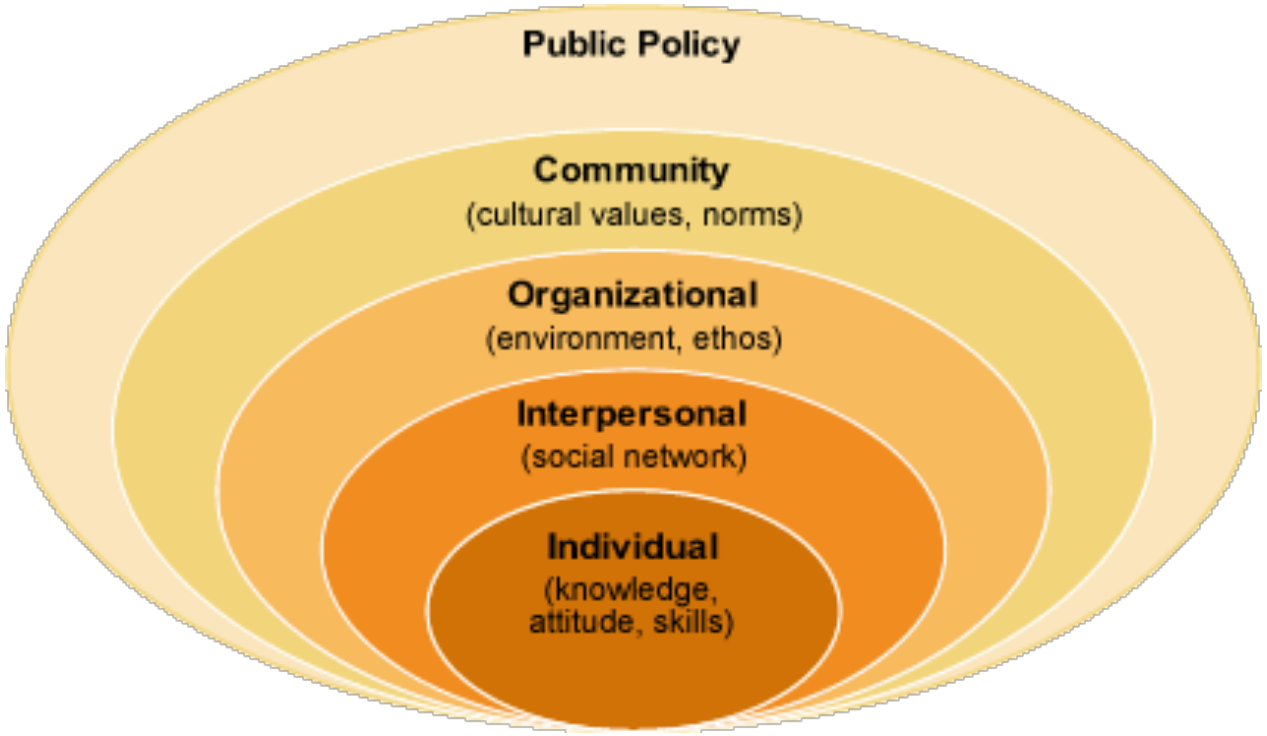
Measuring Context in Implementation Science

- Measure context to choose implementation strategies & make planned adaptations to the EBP (or intervention)
- Identify barriers and facilitators on multiple levels
  - Organizational
  - Provider
  - Patient
- Qualitative and mixed methods approaches



Implementation Science Frameworks

EXPLANATORY OR
DETERMINANT FRAMEWORKS

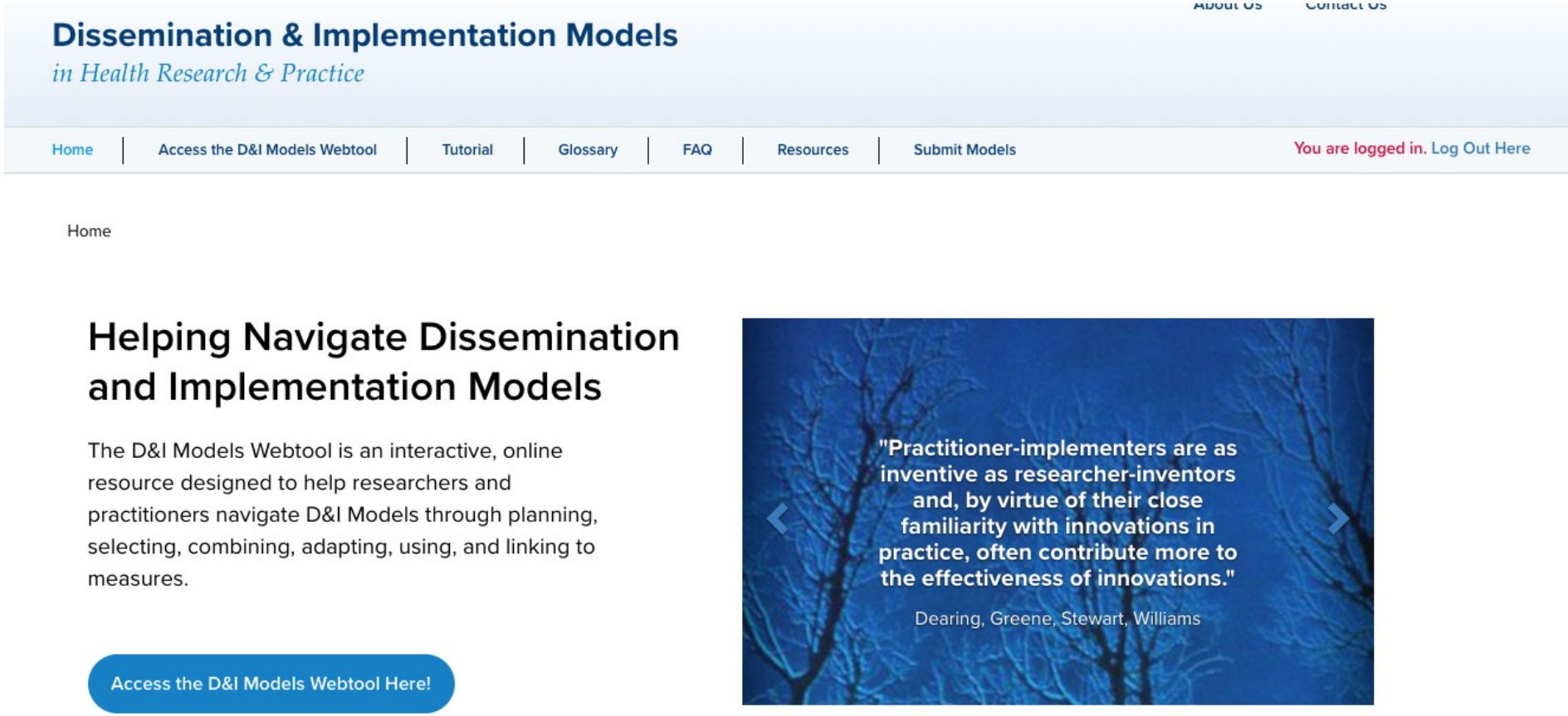
How context and implementation strategies will affect a desired change

Consolidated Framework for Implementation Science (CFIR)

integrated - Promoting Action on Research Implementation in Health Services (i-PARIHS)

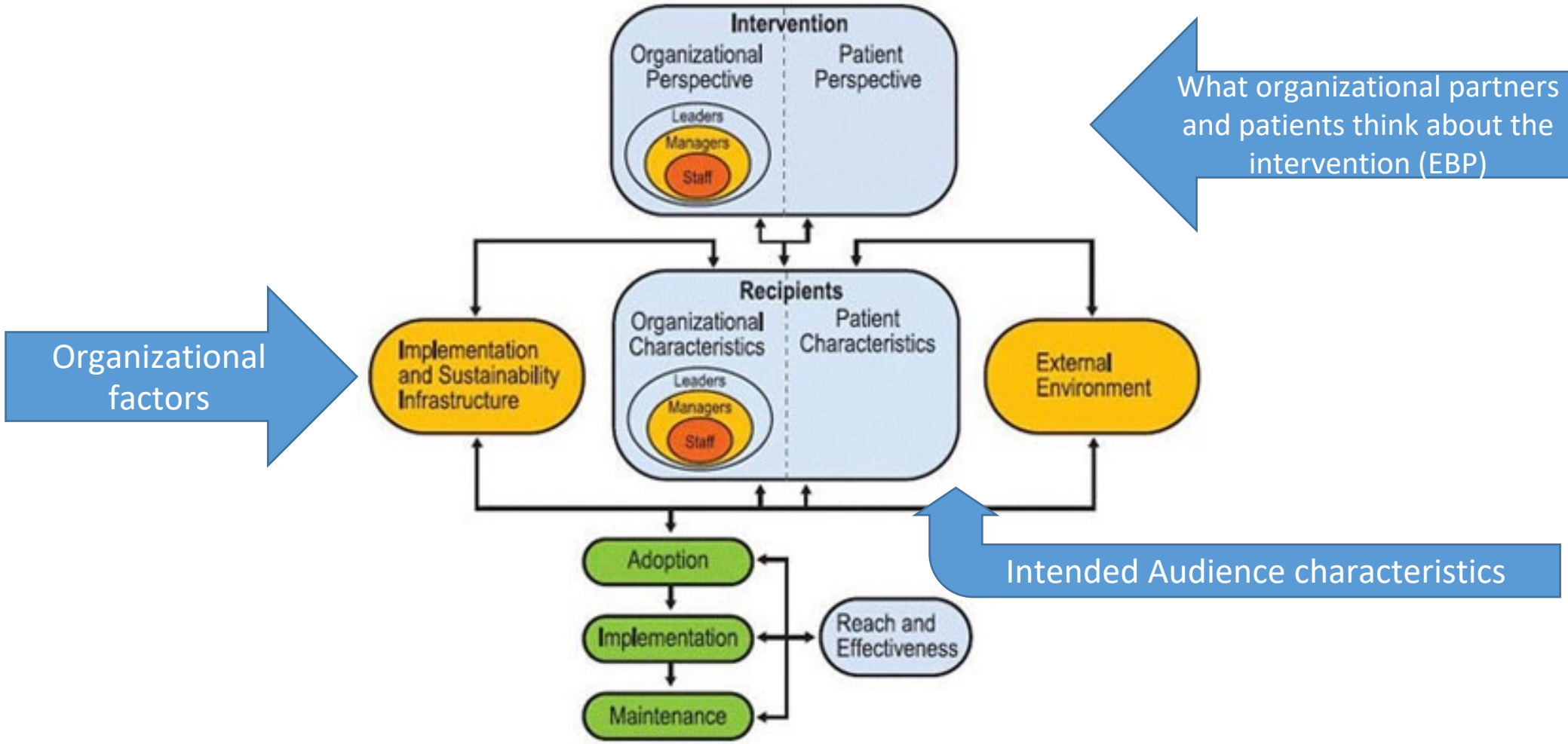
Practical Robust Implementation and Sustainability Model (PRISM)

Which framework?



https://dissemination-implementation.org/

Practical, Robust Implementation and Sustainability Model (PRISM)



Feldstein, et al, 2008

Context in Quality Improvement

Process mapping

Key Informant Interviews

Key Driver Diagram

5 Whys (Root Cause Analysis)

“QI is an inside job.”

Context in Quality Improvement Science

Physical and sociocultural makeup of the local environment

- Environmental factor
- Organizational dynamics
- Collaboration Resources
- Leadership

Generalizability of interventions

SQUIRE 2.0 Guidelines

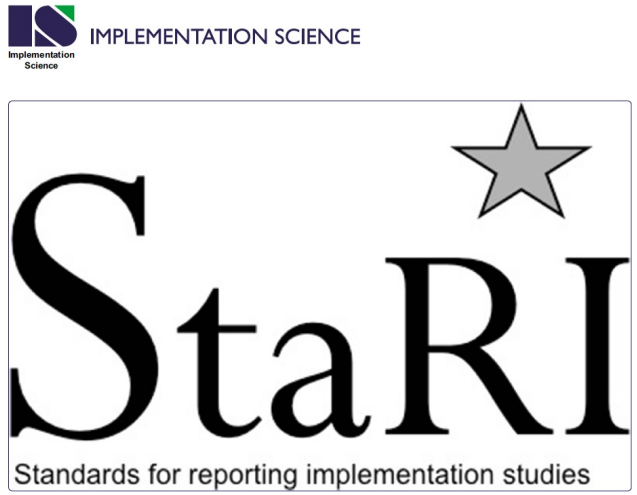
STaRI

Standards for Reporting Implementation Studies (STaRI) guidelines

Describe the context in which the intervention was implemented

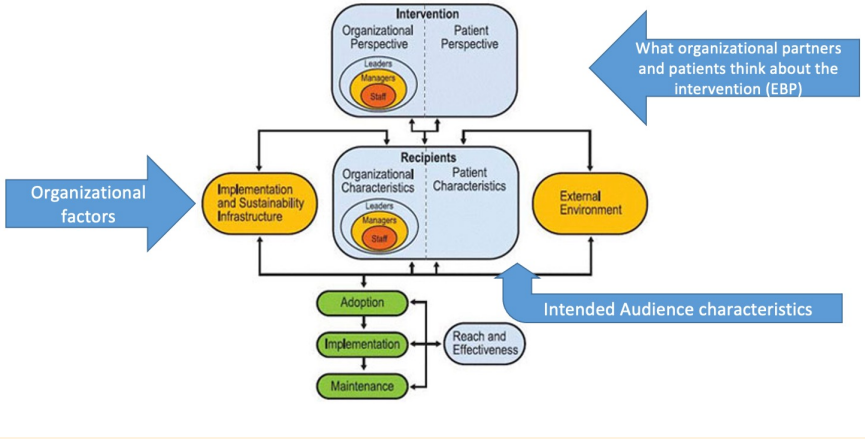
- Social
- Economic
- Policy
- Healthcare
- Organizational barriers and facilitators

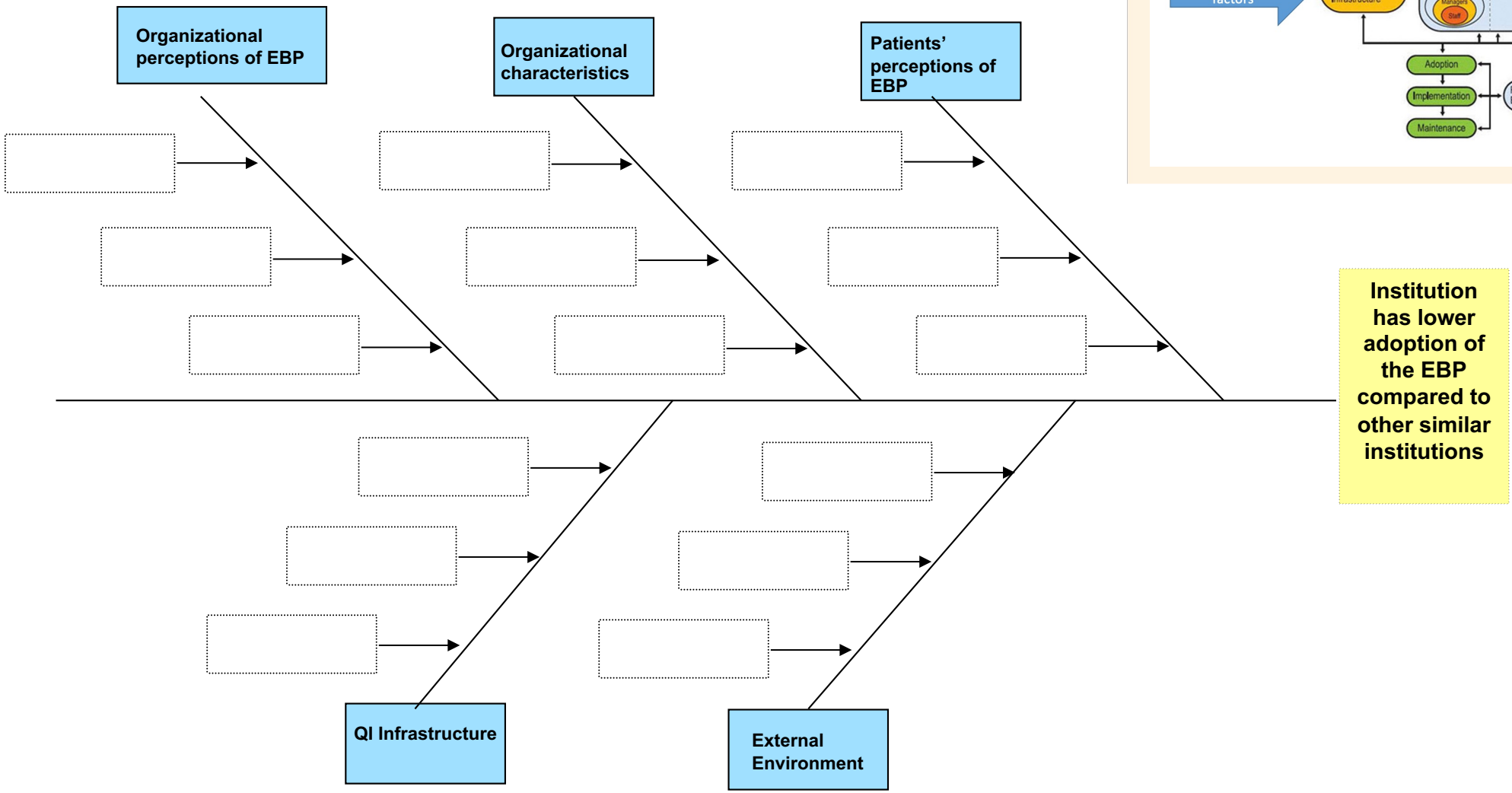
Might influence implementation elsewhere



Partnering with QI teams to Measure Context

Fishbone + PRISM





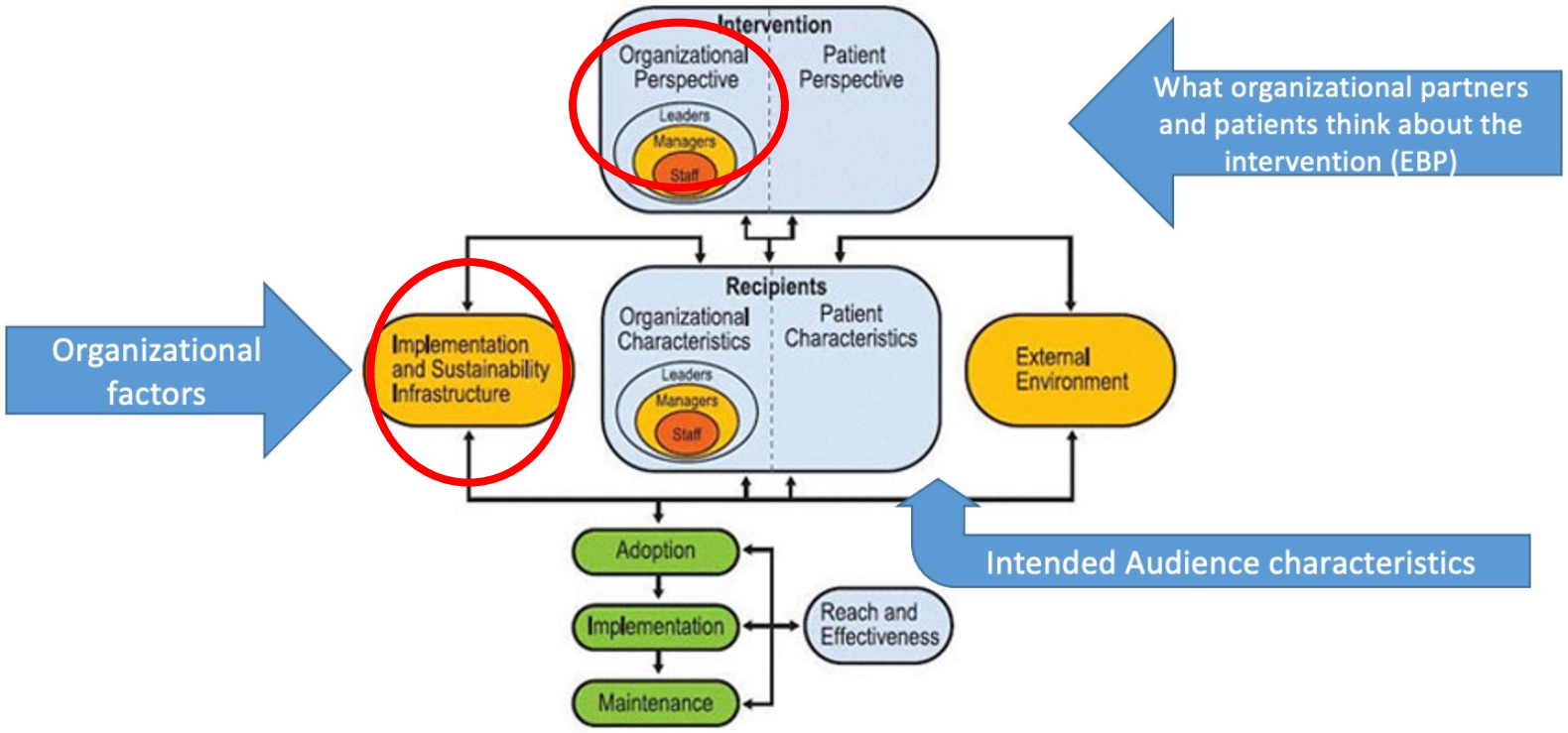
Equity-focused Quality Improvement

Choosing Equity-focused interventions in QI

"QI is an inside job."

Who's on the QI team?

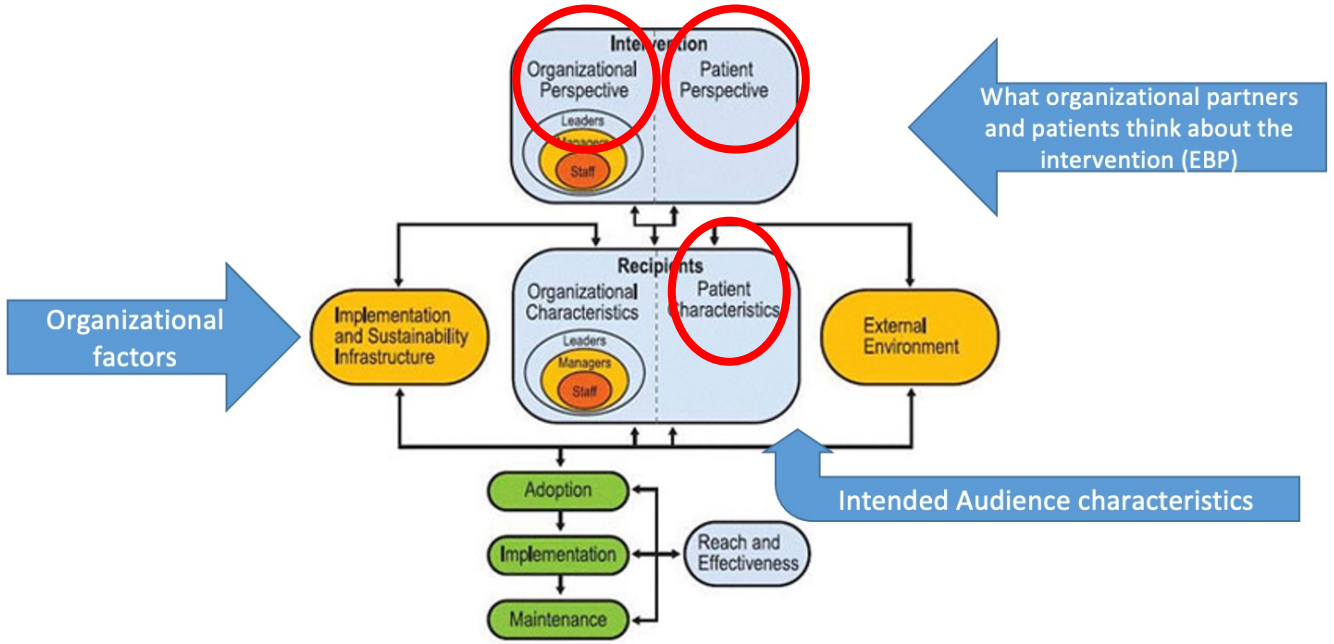
↑ Representativeness



Choosing Equity-focused interventions in QI

Whose voices are included when selecting and studying interventions?

Voice of the customer
Process mapping
Interviews
Kaizen events
5 Whys

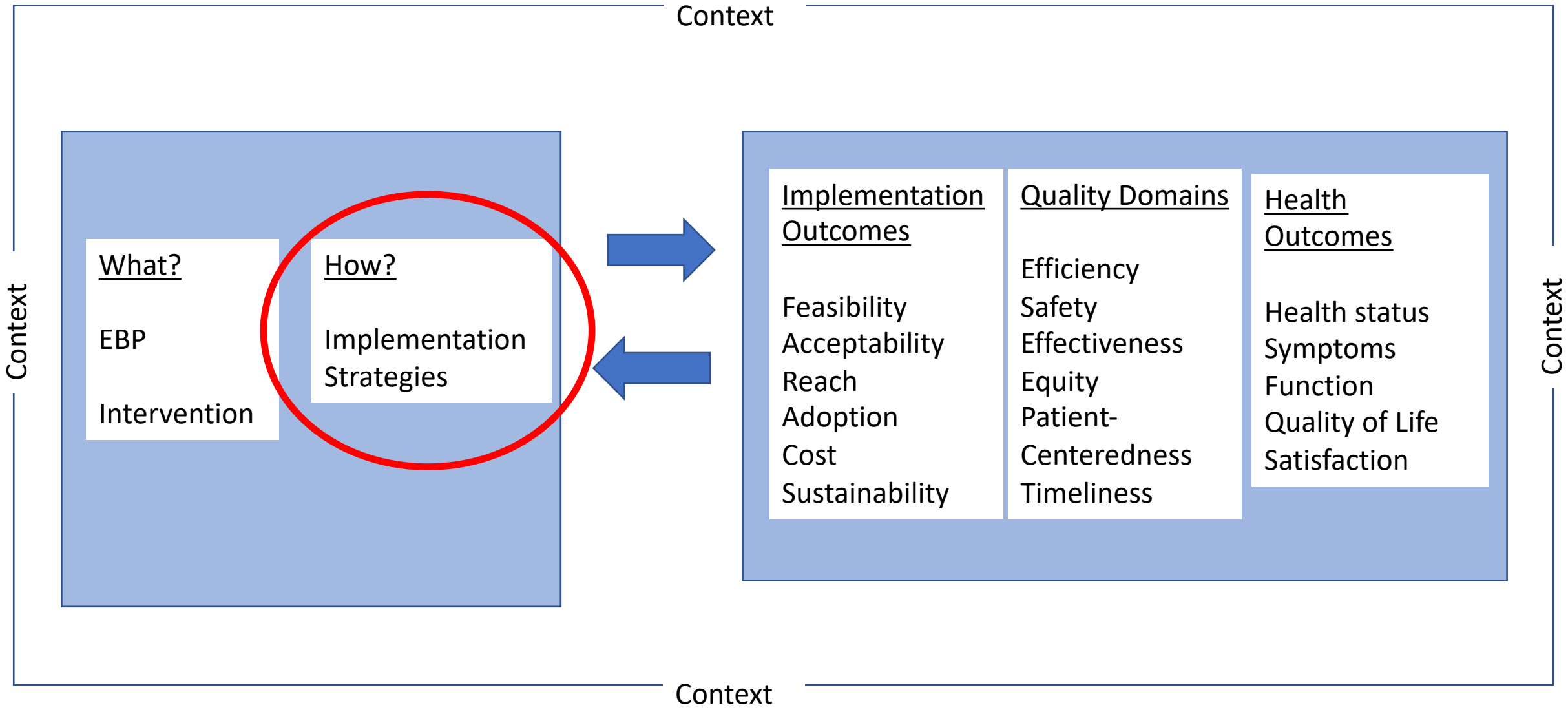


Average perspective?

Outliers?

Traditionally Marginalized populations?

Context informs selection of implementation strategies



Adapted from the Implementation Research and Practice course at Johns Hopkins Bloomberg School of Public Health

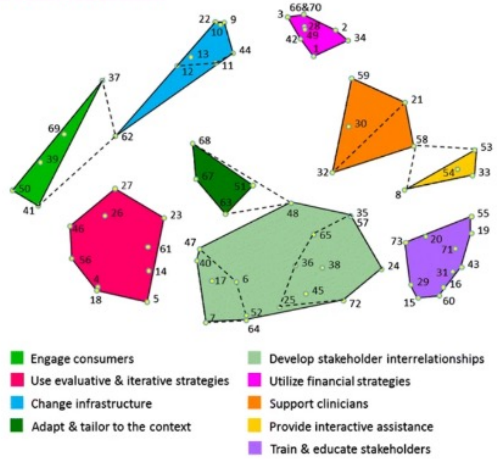
Implementation Strategies

Expert Recommendations for Implementing Change (ERIC) study

Expert panel -Delphi technique to generate consensus

73 strategies

From: Use of concept mapping to characterize relationships among implementation strategies and assess their feasibility and importance: results from the Expert Recommendations for Implementing Change (ERIC) study



Implementation Science (2015) 10:21
DOI 10.1186/s13012-015-0209-1

RESEARCH Open Access

A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project

Byron J Powell[1*], Thomas J Waltz[2], Matthew J Chinman[3,4], Laura J Damschroder[5], Jeffrey L Smith[6], Monica M Matthieu[6,7], Enola K Proctor[8] and JoAnn E Kirchner[6,9]

Powell,et al. 2015

Selecting Implementation Strategies

- No universally effective strategies
- Need more studies on what strategies are most effective in which contexts

ISLAGIATT Model

(It Seemed Like A Good Idea At The Time)

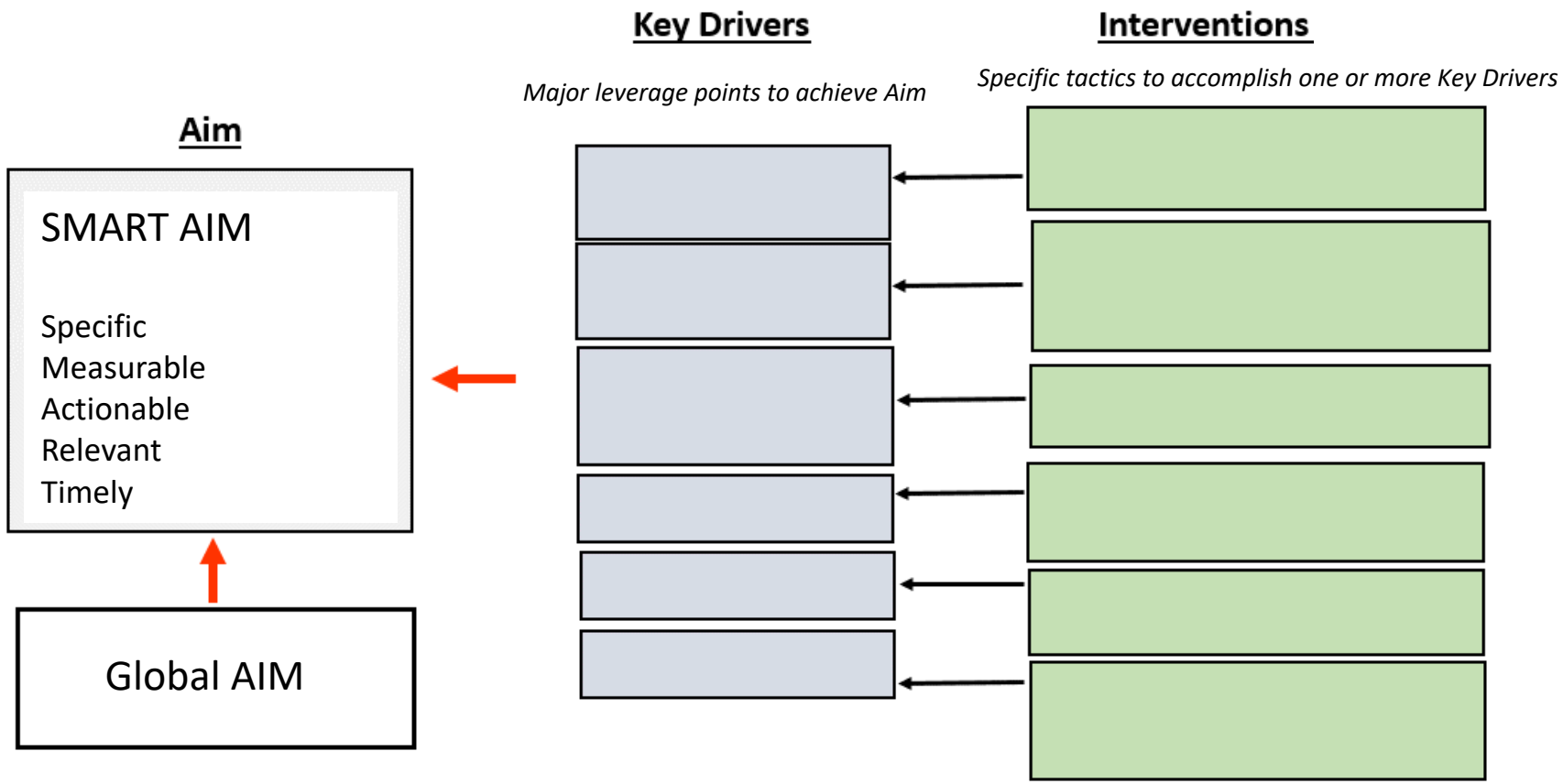
Slide Credit: Byron Powell

Selecting Implementation Strategies

- Choose strategies that you hypothesize will work to address your barriers

- Consider effectiveness and feasibility
  - Experience in your organization
  - Cost/effort/ resources/time

Key Driver Diagram

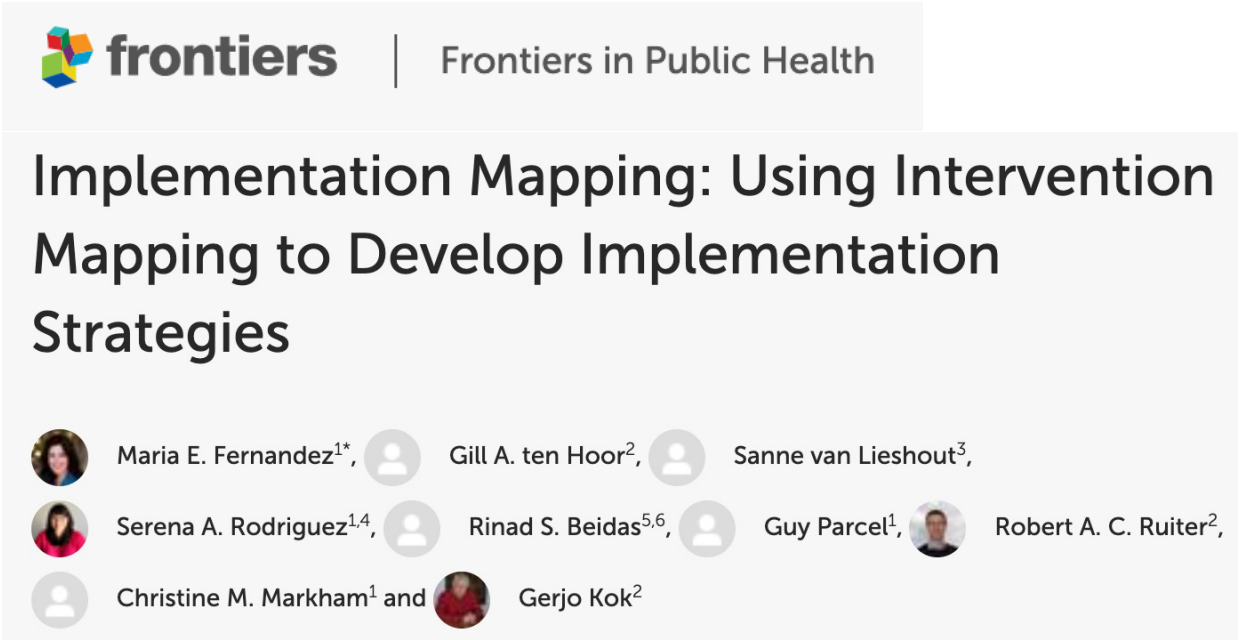


Selecting Implementation Strategies

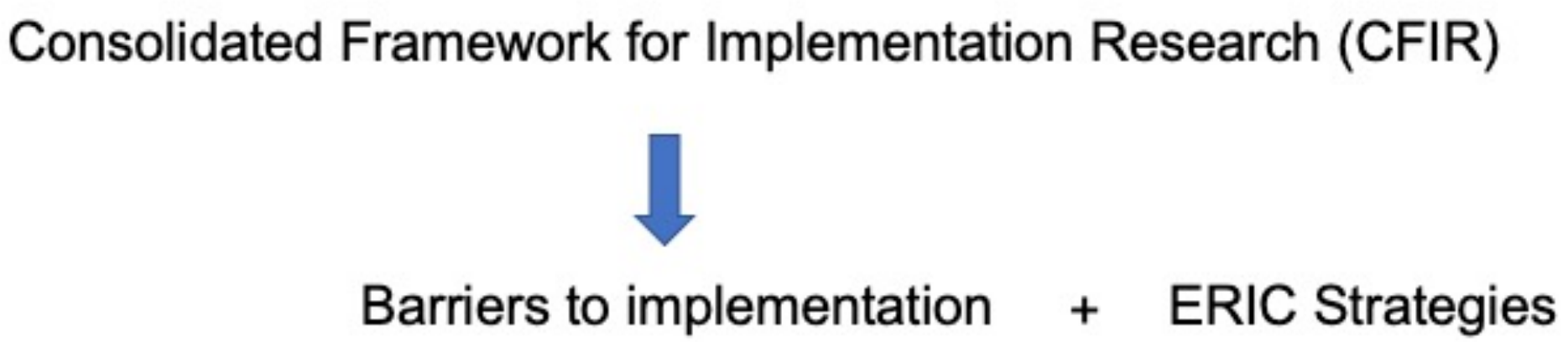
5 step process for selecting implementation strategies

- Choose mechanisms of change and select or design implementation strategies
- Produce implementation protocols and materials
- Evaluate implementation outcomes

Iterative with the planner circling back to previous steps throughout this process



Tailoring Implementation Strategies to Context

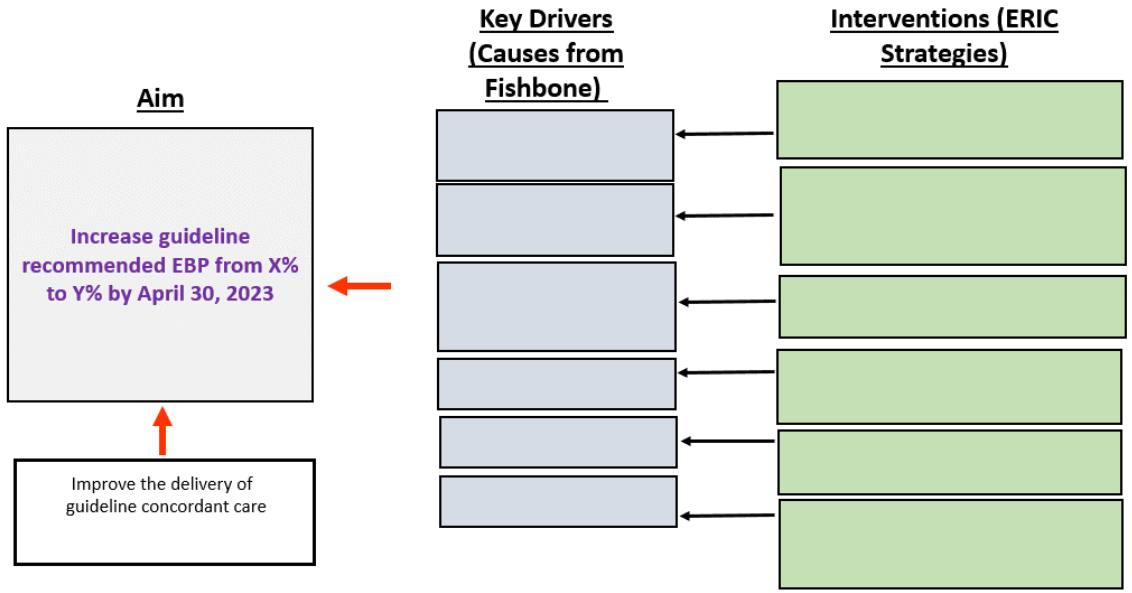


CFIR ERIC Matching Tool

- Surveyed “implementation experts” (n=169) who selected implementation strategies they felt would best address each CFIR barrier

Selecting Strategies

ERIC Strategies + Key Driver Diagram



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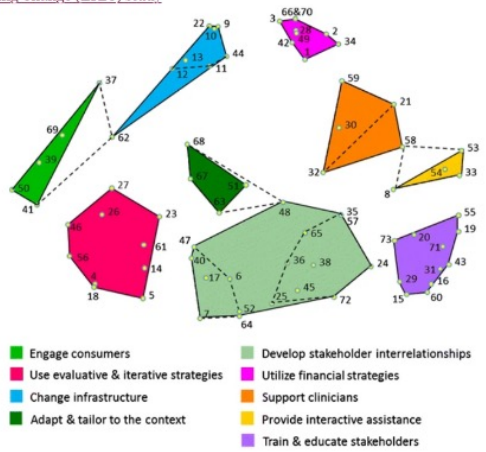
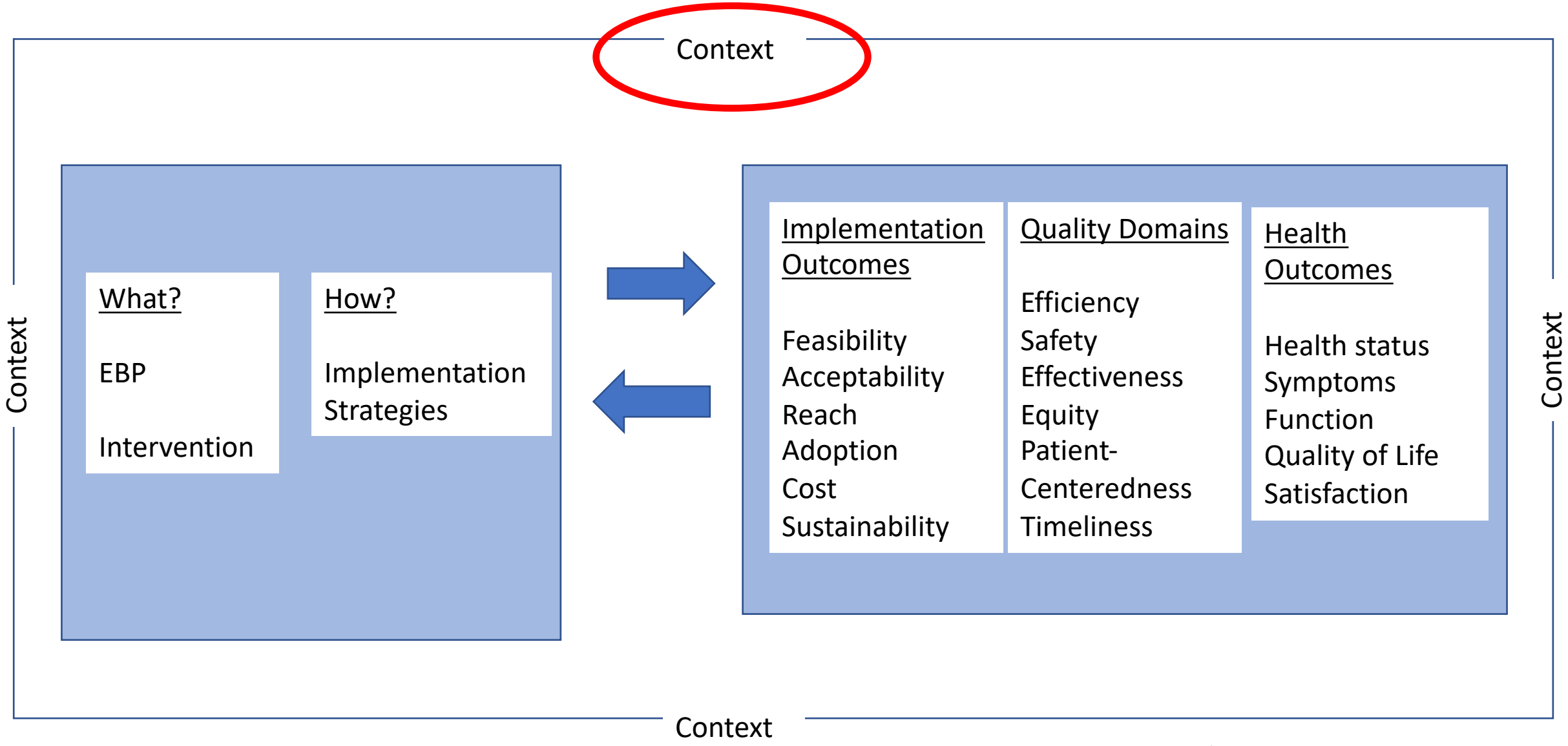


Adapting EBP and Implementation Strategies to Context



Adapted from the Implementation Research and Practice course at Johns Hopkins Bloomberg School of Public Health

Adapting EBP and Implementation Strategies to Context

Modifications are often made to evidence-based interventions and implementation strategies

When?

How?

Why?

Impact?

Debate | Open Access | Published: 06 June 2019

The FRAME: an expanded framework for reporting adaptations and modifications to evidence-based interventions

Shannon Wiltsey Stirman, Ana A. Baumann & Christopher J. Miller

Implementation Science **14**, Article number: 58 (2019) | Cite this article

35k Accesses | **267** Citations | **68** Altmetric | Metrics

Debate | Open Access | Published: 07 April 2021

The FRAME-IS: a framework for documenting modifications to implementation strategies in healthcare

Christopher J. Miller, Miya L. Barnett, Ana A. Baumann, Cassidy A. Gutner & Shannon Wiltsey-Stirman

Implementation Science **16**, Article number: 36 (2021) | Cite this article

9940 Accesses | **50** Citations | **42** Altmetric | Metrics

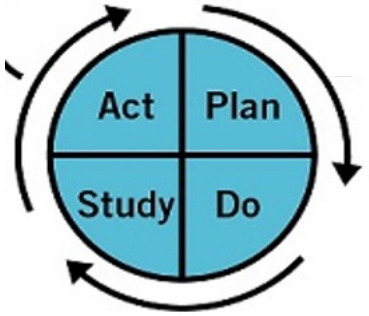
Using the Model for Improvement to tailor interventions (EBP) to context

Tailoring Interventions (EBPs) to Context

What is the reason for changing the EBP or implementation strategies?

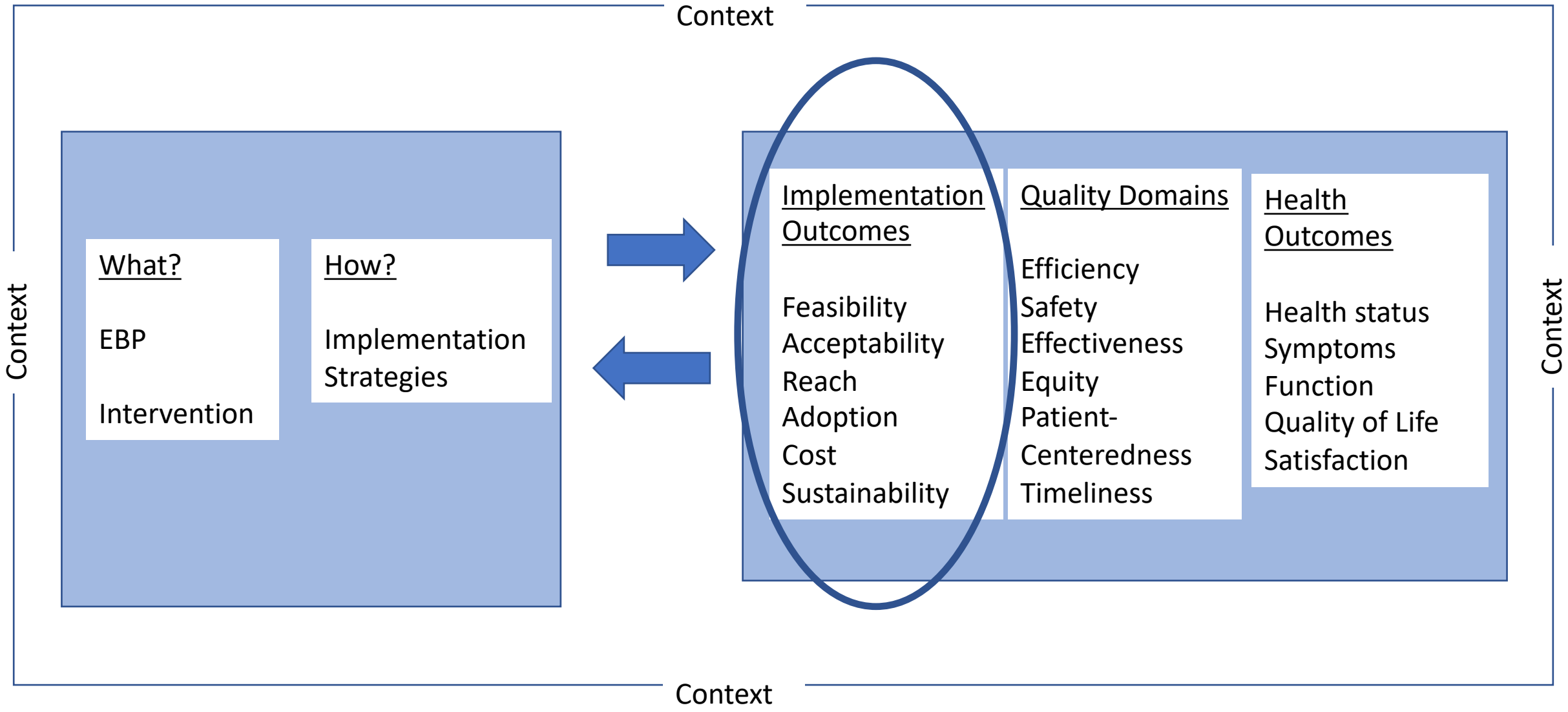
How will we know the change is an improvement?

What change to the EBP or implementation strategy will result in improvement?



1. Carefully outline or plan the change
2. Make the change
3. Study the change
   - (Was it carried out as planned? Was there improvement?)
4. Act on those results
   - (Abandon the change/Make additional changes/ Adopt the intervention)

Implementation outcomes



Adapted from the Implementation Research and Practice course at Johns Hopkins Bloomberg School of Public Health

Implementation Outcomes

Effective intervention (EBP), unsuccessfully implemented

Ineffective intervention (EBP), successfully implemented

- Acceptability
- Appropriateness
- Feasibility
- Adoption
- Fidelity
- Implementation Costs
- Penetration
- Sustainability

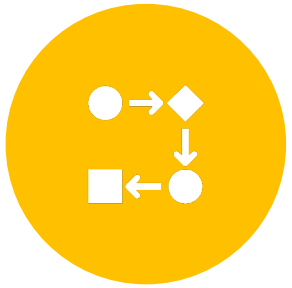
Proctor, et al 2009

Using Implementation Outcomes in QI

QI Measures

Outcomes

Balancing



Process

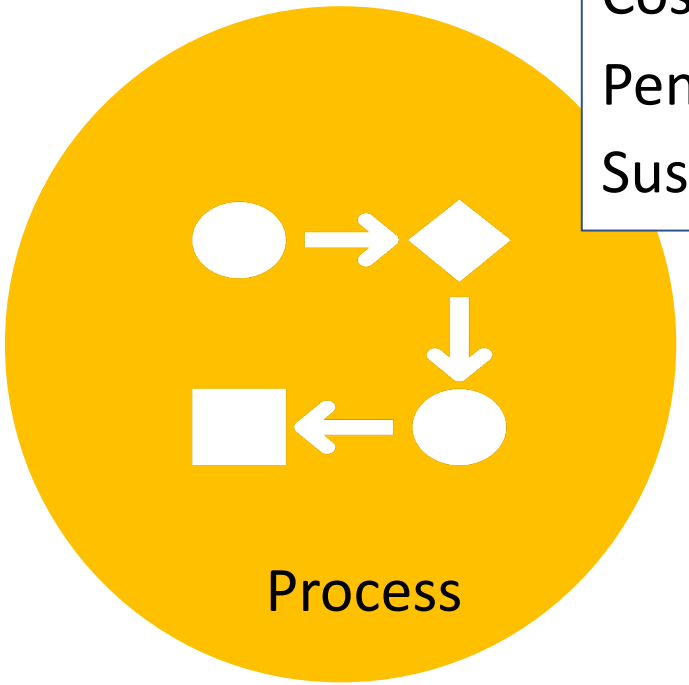
Financial

Implementation Outcomes + QI Measures

- Acceptability
- Appropriateness
- Feasibility
- Adoption
- Fidelity
- Cost
- Penetration
- Sustainability

Outcomes

Balancing



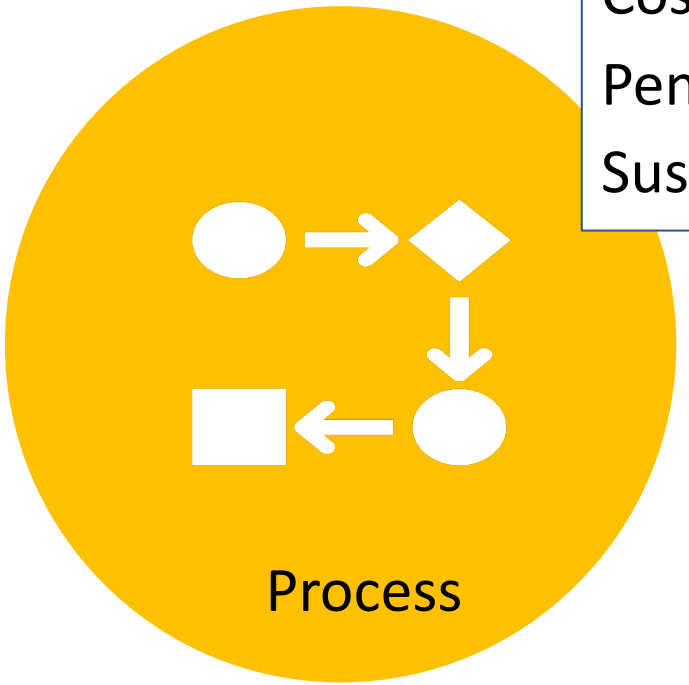
Financial

Implementation Outcomes + QI Outcomes

PDSA cycles

Spread

- Acceptability
- Appropriateness
- Feasibility
- Adoption
- Fidelity
- Cost
- Penetration
- Sustainability



Outcomes

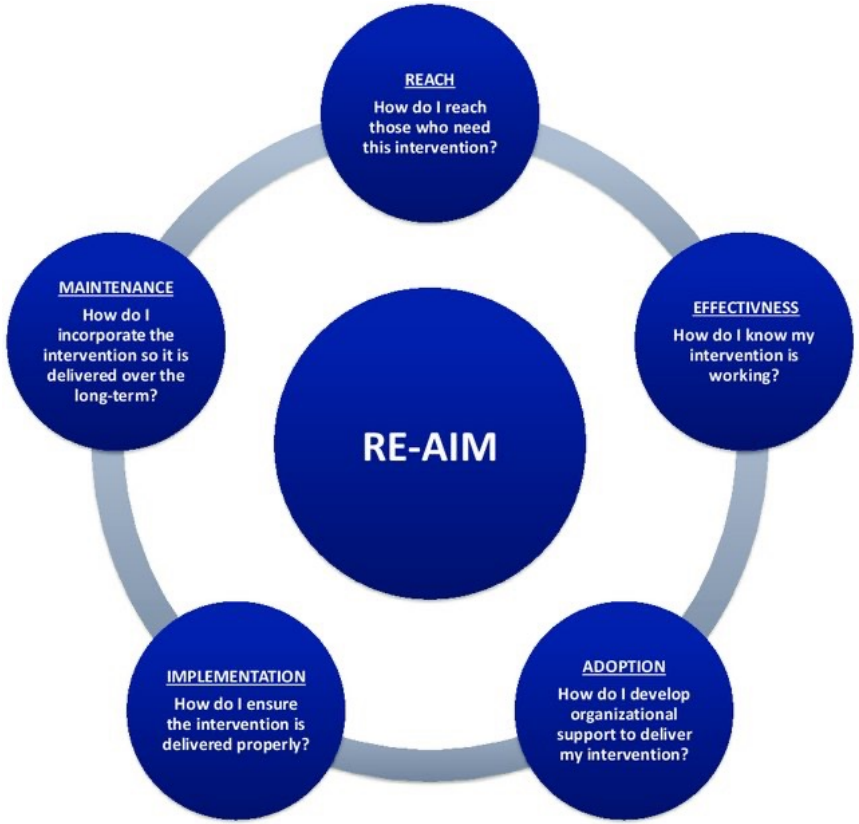
Balancing

Financial

Implementation Science Frameworks

EVALUATION FRAMEWORKS

Assess implementation outcomes



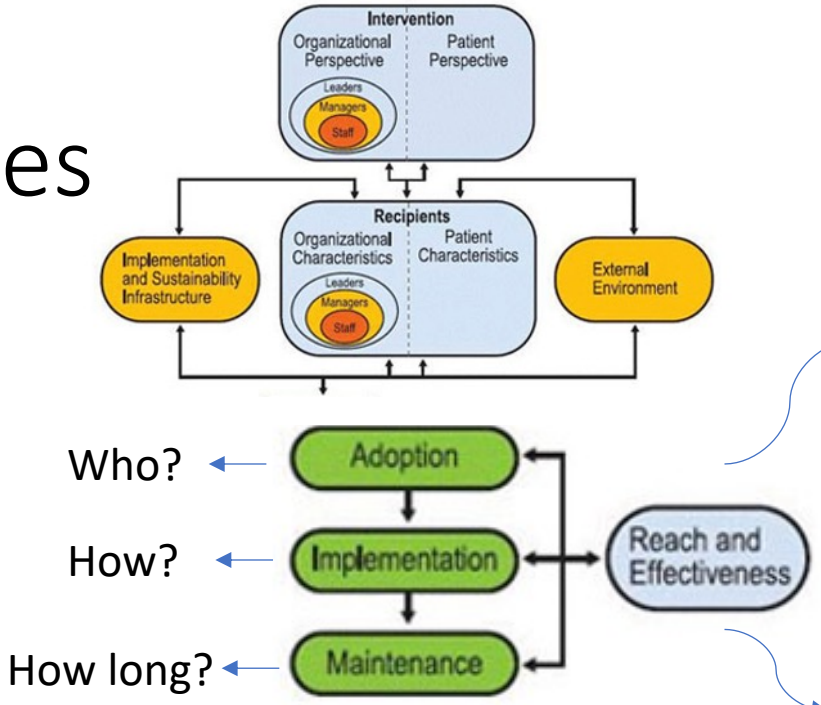
RE-AIM Implementation Science Framework

RE-AIM Dimension	What to Consider
Reach	Who is intended to benefit from the EBP? Who actually does? How representative are the individuals who receive the EBP of the population?
Effectiveness	What is the benefit you are trying to achieve with EBP?
	What is the likelihood of negative outcomes?
Adoption	Who delivers the EBP?
Implementation	How consistently is the EBP delivered? How is the EBP adapted to fit the context? How much does it cost?
Maintenance	The extent to which the EBP becomes part of routine organizational practices and maintains effectiveness

Glasgow & Estabrooks, 2018

Practical, Robust Implementation and Sustainability Model (PRISM)

RE-AIM Outcomes



Who is intended to benefit from the EBP?
Who actually does?
How representative are the individuals who receive the EBP of the population?

EBP or intervention is working

Glasgow & Estabrooks, 2018

Using Implementation Science Evaluation Frameworks to expand on QI measures

Measuring Outcomes

RE-AIM Dimension	What to Consider	QI Outcome
Reach	Who is intended to benefit from the EBP? Who actually does? How representative are the individuals who receive the EBP of the population?	Outcome
Effectiveness	What is the benefit you are trying to achieve with EBP?	
	What is the likelihood of negative outcomes?	
Adoption	Who delivers the EBP?	
Implementation	How consistently is the EBP delivered? Why is implementation successful or not? (Proctor's outcomes) How is the EBP adapted to fit the context? How much does it cost?	
Maintenance	The extent to which the EBP becomes part of routine organizational practices and maintains effectiveness	

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Measuring Outcomes

RE-AIM Dimension	What to Consider	QI Outcome
Reach	Who is intended to benefit from the EBP? Who actually does? How representative are the individuals who receive the EBP of the population?	Outcome
Effectiveness	What is the benefit you are trying to achieve with EBP?	
	What is the likelihood of negative outcomes?	Balancing
Adoption	Who delivers the EBP?	
Implementation	How consistently is the EBP delivered? Why is implementation successful or not? (Proctor's outcomes) How is the EBP adapted to fit the context? How much does it cost?	
Maintenance	The extent to which the EBP becomes part of routine organizational practices and maintains effectiveness	Outcome

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Measuring Outcomes

RE-AIM Dimension	What to Consider	QI Outcome
Reach	Who is intended to benefit from the EBP? Who actually does? How representative are the individuals who receive the EBP of the population?	Outcome
Effectiveness	What is the benefit you are trying to achieve with EBP?	Outcome
	What is the likelihood of negative outcomes?	Balancing
Adoption	Who delivers the EBP?	Process
Implementation	How consistently is the EBP delivered? Why is implementation successful or not? (Proctor's outcomes) How is the EBP adapted to fit the context? How much does it cost?	Process Financial
Maintenance	The extent to which the EBP becomes part of routine organizational practices and maintains effectiveness	Outcome

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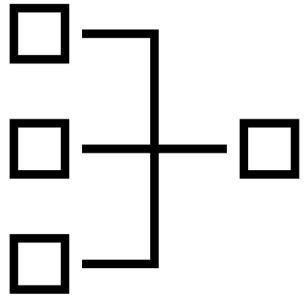
Implementation Research

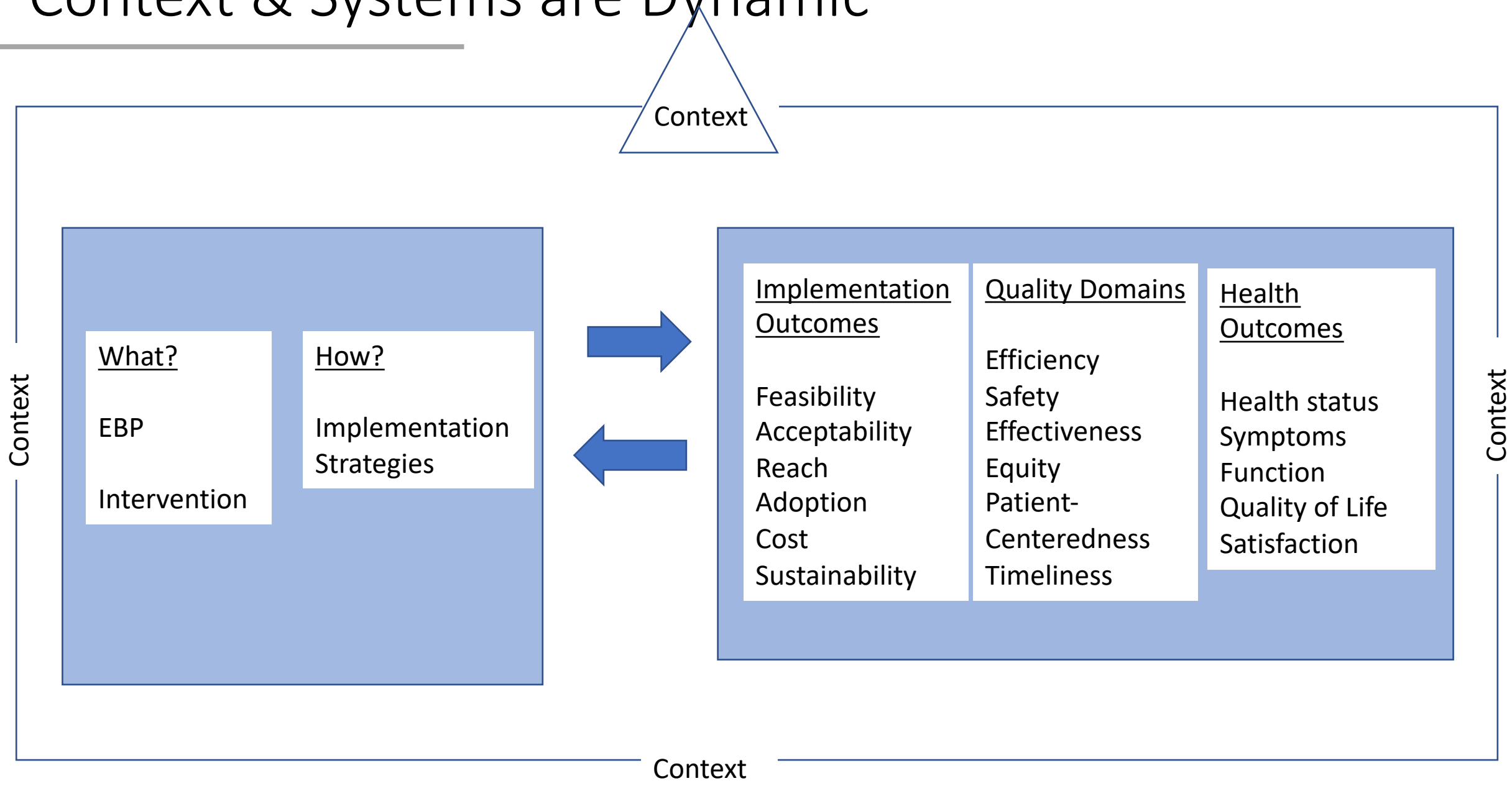
“Context is King”

Improvement Science



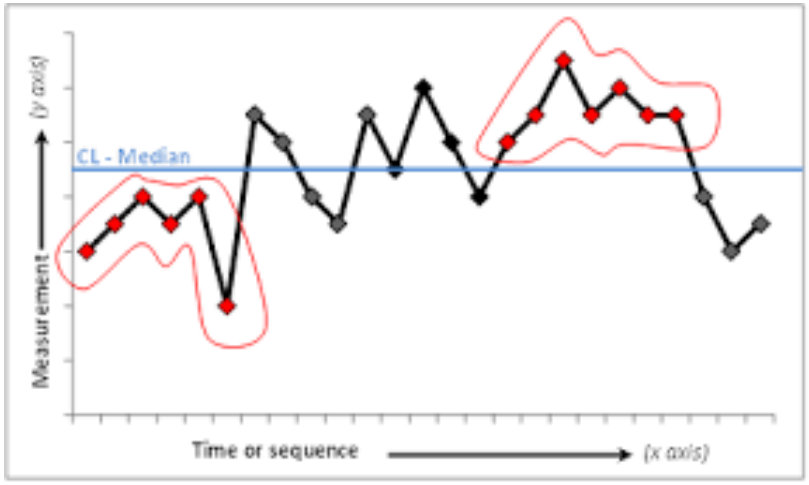
“Every system is perfectly designed
for the results it achieves”

Context & Systems are Dynamic



Adapted from the Implementation Research and Practice course at Johns Hopkins Bloomberg School of Public Health

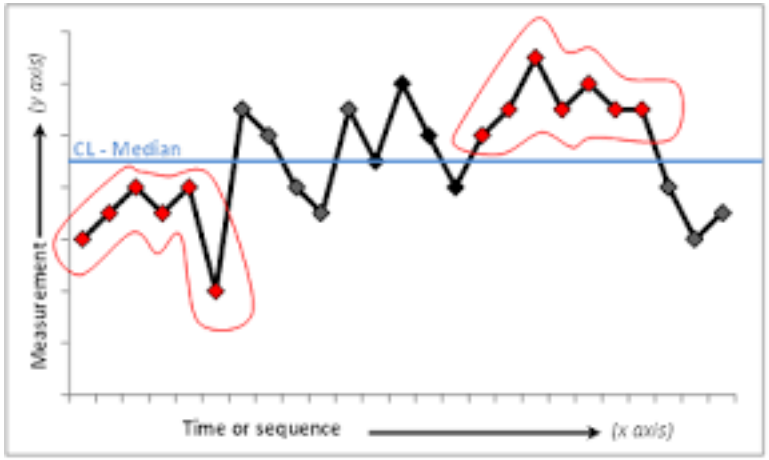
Data in Quality Improvement



- Use data over time and rules for interpretation
  - Run charts or control charts
  - Signal when there is real improvement or real change in the wrong direction
  - Avoids over/under reactions

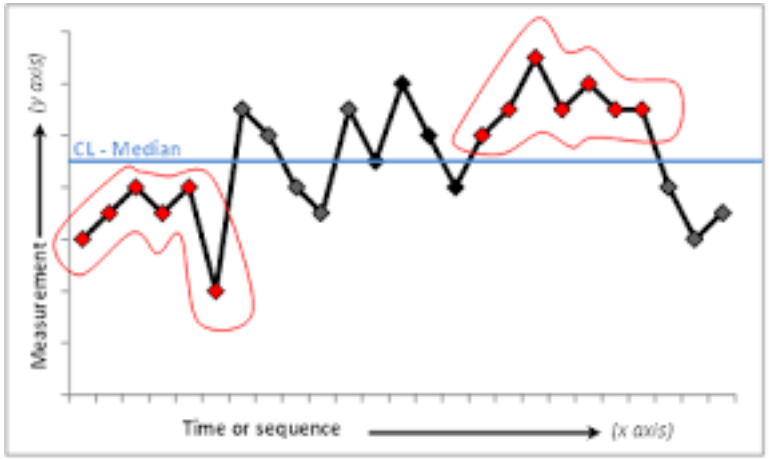
Improve sustainability by utilizing Control Charts to Identify the need to adapt to context

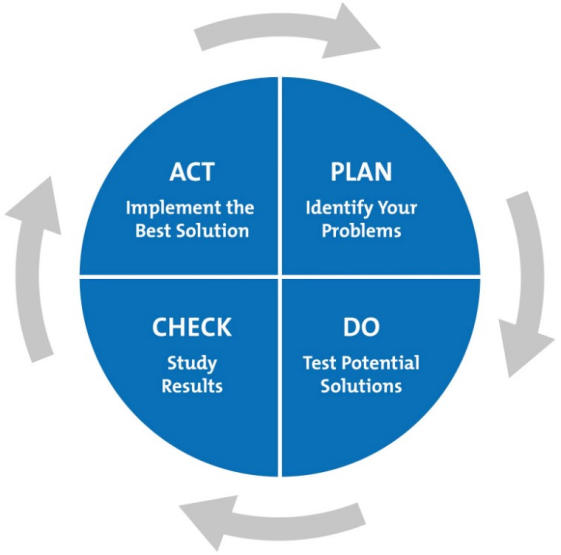
Control Charts + Adaptation



- A change in the wrong direction may signify change in context and/or system and the need for adaptations of the intervention or EBP and implementation strategies

Quality Improvement is Rapid and Iterative





- The model for improvement (PDSA) can be used rapidly and iteratively adapt the “What” & “How” to the changing context

What did we learn?

Explain Quality Improvement and Implementation Science to a Colleague

- Implementation Science: How do we get clinicians to use knowledge in practice?
- Quality Improvement: Improve the quality of healthcare delivery

Identify ways Implementation Science and QI Overlap

- Different starting points, different stated focus, and different methods
- Both working to improve outcomes and ‘in action’ may look the same

What did we learn?

Ways you can integrate Implementation Research and QI

Partner with QI teams to Measure Context	Combine Implementation Science Frameworks with QI tool (e.g. PRISM + Fishbone)
Use IS framework to improve the equity of QI	QI team representativeness Multi-level and diverse partner engagement
Use ERIC to select interventions or implementation strategies	ERIC + Key Driver Diagram CFIR-ERIC matching Tool
Using the Model for Improvement to tailor interventions (EBP) to context	
Use Implementation Outcomes	Enhance PDSA cycles and spread and sustain results Expand on QI measures (e.g. Reach)
Use Data over time and PDSA cycles to measure and rapidly adapt to changing context	

Questions or Comments?

Thank you

- Amy Tyler, MD, MSCS