

De-mystifying Implementation Research

15 April 2016 – UZ-UCSF Journal Club

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Two excellent articles to guide you in *learning about and doing* implementation science

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An introduction to implementation science for the non-specialist



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Abstract

Background: The movement of evidence-based practices (EBPs) into routine clinical usage is not spontaneous, but requires focused efforts. The field of implementation science has developed to facilitate the spread of EBPs, including both psychosocial and medical interventions for mental and physical health concerns.

Discussion: The authors aim to introduce implementation science principles to non-specialist investigators, administrators, and policymakers seeking to become familiar with this emerging field. This introduction is based on published literature and the authors' experience as researchers in the field, as well as extensive service as implementation science grant reviewers.

Proctor et al. *Implementation Science* 2012, 7:96
<http://www.implementation-science.com/content/7/1/96>



IMPLEMENTATION SCIENCE

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Writing implementation research grant proposals: ten key ingredients

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Abstract

Background: All investigators seeking funding to conduct implementation research face the challenges of preparing a high-quality proposal and demonstrating their capacity to conduct the proposed study. Applicants need to demonstrate the progressive nature of their research agenda and their ability to build cumulatively upon the literature and their own preliminary studies. Because implementation science is an emerging field involving complex and multilevel processes, many investigators may not feel equipped to write competitive proposals, and this concern is pronounced among early stage implementation researchers.

Discussion: This article addresses the challenges of preparing grant applications that succeed in the emerging field of dissemination and implementation. We summarize ten ingredients that are important in implementation research grants. For each, we provide examples of how preliminary data, background literature, and narrative detail

What is implementation research (IR)?

- Implementation research is the scientific enquiry into questions around implementation.
- The basic intent is not only to understand what is working and what is not working, but how and why implementation is going right or wrong, and testing approaches to improve it

Why is research on implementation needed?

- Global health challenge : how to take proven interventions and implement them in the real world.
- Implementation research (IR) is crucial to meeting that challenge, providing a basis for context-specific, evidence-informed decision making needed to make what is possible in theory a reality in practice

Why is research on implementation needed? (cont.)

- Affordable, effective, life-saving interventions exist to confront many of the health challenges we face, but there is little understanding of how best to deliver those interventions across the full range of existing health systems and in the wide diversity of possible settings.
- This carries a heavy price: each year 7.6 million children die from diseases that are preventable or treatable with existing interventions.

Why is research on implementation needed? (cont.)

- Evidence-Based practices (EBP) take on average 17 years to be incorporated into routine general health practice.
- Only about half of EBPs ever reach widespread clinical usage
- Essential that health systems, providers, patients have empirically-supported strategies to integrate knowledge and effective interventions into every day use

How can implementation research (IR) be used?

- Implementation research is vital to understanding context, assessing performance, informing implementation and facilitating health systems strengthening.
 - Produce insights and generalizable knowledge regarding implementation processes, barriers, facilitators, strategies
- Implementation research is particularly important in supporting the scale-up of interventions and integrating them into health systems at the national level.
 - Develop reliable strategies for improving uptake of health interventions; facilitate widespread adoption of these strategies
- Implementation research can also be used to help organizations develop the capacity to learn.

The benefits of IR are maximized where research is answering the questions that decisions-makers and practitioners are asking, or should be asking.

Table 1. Effects of quality improvement on screening and follow-up for cervical cancer in El Salvador

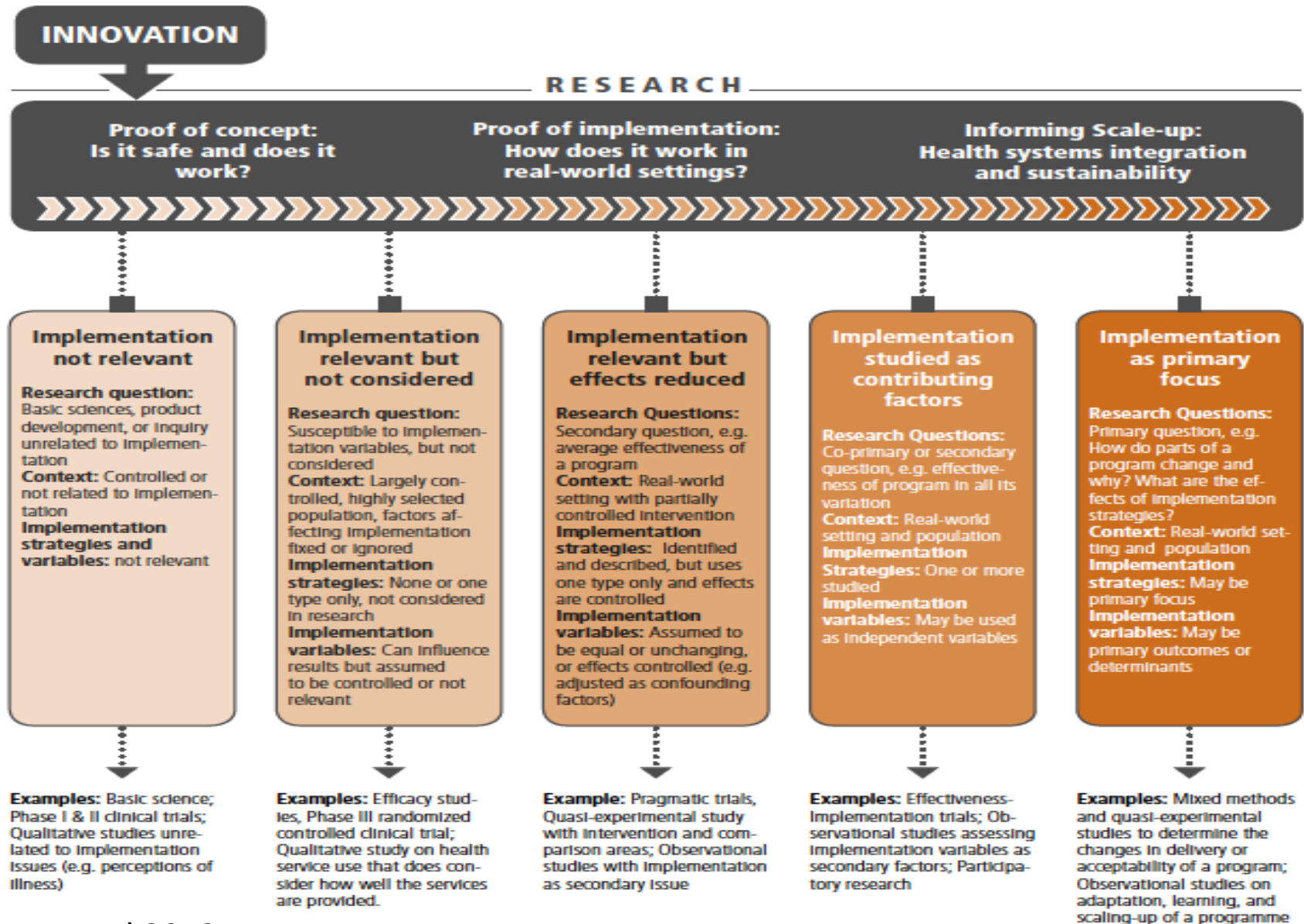
	Pre-Intervention	Post-Intervention
Number of women aged 30–59 years of age screened for first time in last year	Unknown (2446 samples)	3408
Number of unsatisfactory samples	41 (1.7%)	14 (0.4%)
Turnaround time from clinic to laboratory (days)	23	9
Turnaround time from laboratory to clinic (days)	27	11
Number of women followed up with colposcopy for positive Pap	22 (24%)	196 (100%)

Source: Agurto et al., 2006 [17]

How is IR different from the research we are already doing?

1. NOT concerned with discovering new health products, or testing the safety or efficacy of clinical interventions
 - Rather you are testing the effect of a strategy to increase uptake of a proven intervention
2. Outcome variables go beyond health status, and beyond the individual
 - Rather you use an IR FRAMEWORK to conceptualize and measure implementation outcomes (e.g. adoption, fidelity, implementation cost, etc.) at patient, provider, system, policy levels
3. LESS concerned with highly controlled strict standardization of implementations (internal validity)
 - Rather you plan for modifications in intervention implementation, evaluate the modifications, and adapt study (maximize generalizability/external validity)

The continuum of Implementation



Why are we well positioned to conduct implementation research?

- Experience with developing and testing the health interventions that need to be scaled up
- Strong multidisciplinary teams, experienced research staff
- Strong relationships between researchers and community based health settings
- To gain more experience in implementation strategies
 - Read the literature (Implementation Science Journal)
 - UCSF has an online implementation science training program (<https://accelerate.ucsf.edu/training/ids>)

Types of strategies to improve implementation in health

Main Actor and Areas of Intervention	Implementation Strategy Examples
<p>Government</p> <ul style="list-style-type: none"> • Policy-making, oversight and regulation • Public financing 	<ul style="list-style-type: none"> • Policy reviews • Governance strengthening and corruption reduction strategies • Contracting with performance measures • Decentralize public service provision • Public financing incentives and rules (ways to raise revenues, pool funding, and payment mechanisms) • Public education, behaviour change communication
<p>Implementing and Provider Organizations</p> <ul style="list-style-type: none"> • Organizational improvement and accountability 	<ul style="list-style-type: none"> • Quality improvement/quality assurance/performance management strategies: team problem-solving; develop and apply guidelines and standard operating procedures; regular supervision • Provide financial incentives for teams and individuals based on performance • Reorganize and/or integrate services • Human resource management systems • Facility management and logistics systems strengthening • Strengthen financial management • Marketing health services and products

Types of strategies to improve implementation in health (cont.)

<p>Individual Providers and Front-line Workers</p> <ul style="list-style-type: none">• Individual practices	<ul style="list-style-type: none">• Continuing education and training• Peer learning and support• Job aids
<p>Communities and Households</p> <ul style="list-style-type: none">• Empowerment, participation, education• Individual practices	<ul style="list-style-type: none">• Community information and education: training community health workers; training of community members such as youth, mothers (in groups, home, mass media); social marketing and demand creation• Strengthen inclusion and participation: community-managed services; community partnerships and co-management; community-owned services• Strengthen local accountability: joint monitoring; provider accountability schemes; community-based information systems• Local organizational capacity building: community mobilization; community boards and structures to oversee and manage• Financial empowerment: community financing; in-kind subsidies and vouchers; community participatory budgeting; incorporation with income generating and micro-financing schemes• Peer support for health services and healthy behaviours

Typical study designs in IR research

- Draws on a wide variety of research approaches and disciplines, makes little sense to talk in terms of ‘implementation research methods’.
- All research designs are possible!
 - RCTS, pilot studies, qualitative, quantitative, etc.
- Some designs are particularly useful
 - Interrupted time series
 - Stepped wedge
 - Effectiveness-implementation hybrids
 - Mixed method qualitative and quantitative studies

Hybrid Study Designs: Blending Implementation and Effectiveness Research

Study Characteristic	Hybrid Type I	Hybrid Type II	Hybrid Type III
<p>Research Questions (examples)</p>	<p><u>Primary Question:</u> Will a clinical treatment work in this setting/these patients?</p> <p><u>Secondary Question:</u> What are the potential barriers/facilitators to a treatment's implementation?</p>	<p><u>Primary Questions:</u> Will a clinical treatment work in this setting/these patients?</p> <p>Does the implementation method show promise?</p>	<p><u>Primary Question:</u> Which method works better in facilitating implementation of a clinical treatment? Which core components are critical?</p> <p><u>Secondary Question:</u> Is the treatment effective in this setting/these patients?</p>

The research question is king!

- Typical progression of research questions:
 - What should be done to address X problem?
 - Is an evidence based practice (EBP) being used?
 - If not, why not?
 - What factors influence the EBP being used
 - What else needs to be done to facilitate the use of the EBP?
 - How do you know that what you've done is effective?

Implementation Outcome	Working Definition*	Related terms**
Acceptability	The perception among stakeholders (e.g. consumers, providers, managers, policy-makers) that an intervention is agreeable	Factors related to acceptability: (e.g. comfort, relative advantage, credibility)
Adoption	The intention, initial decision, or action to try to employ a new intervention	Uptake, Utilization, Intention to try
Appropriateness	The perceived fit or relevance of the intervention in a particular setting or for a particular target audience (e.g. provider or consumer) or issue	Relevance, Perceived fit, Compatibility, Trialability, Suitability, Usefulness, Practicability
Feasibility	The extent to which an intervention can be carried out in a particular setting or organization	Practicality, Actual fit, Utility, Suitability for everyday use
Fidelity	The degree to which an intervention was implemented as it was designed in an original protocol, plan, or policy	Adherence, Delivery as intended, Treatment integrity, Quality of programme delivery, Intensity or dosage of delivery
Implementation cost	The incremental cost of the delivery strategy (e.g. how the services are delivered in a particular setting). The total cost of implementation would also include the cost of the intervention itself.	Marginal cost***
Coverage	The degree to which the population that is eligible to benefit from an intervention actually receives it.	Reach, Access, Service Spread or Effective Coverage (focusing on those that need an intervention and its delivery at sufficient quality, thus combining coverage and fidelity), Penetration (focusing on the degree to which an intervention is integrated in a service setting)
Sustainability	The extent to which an intervention is maintained or institutionalized in a given setting.	Maintenance, Continuation, Durability, Institutionalization, Routinization, Integration, Incorporation

Typical outcome variables in IR research

Theories and Frameworks: why are they important for IR research?

- Theory : systematic way of understanding events or behaviors by providing interrelated concepts, definitions, and propositions that explain or predict events by specifying relationships among variables (Tabak et al 2012)
- Frameworks: strategic or action-planning models that provide a systematic way to develop, manage, and evaluate your study (Tabak et al 2012)
- Frameworks: often contain theories; theories don't typically have frameworks
- You often need a theory and a framework!
 - Theory of how your intervention will impact on implementation (e.g Theory of Planned Behavior; Health Belief Theory)
 - Framework to guide implementation (e.g. Consolidated Framework for Implementation Research; RE-AIM)

Theories and Frameworks: why are they important for IR research? (cont.)


- In IR research, you are attempting to change something (s)
 - need a theory of how that change will occur
- Your theory of how change will occur drives what you decide to do
 - What/who to target (may have multiple targets)
 - How to foster change (may have/need multiple strategies)
- Change is a process: a framework can help you to parse out your process, e.g. into phases
- Frameworks can enhance interpretability of study

How do you find a Theory and a Framework?

- Look for guidance in:
 - Studies that focus on your target of change
 - Studies that use a theories and frameworks similar to what you have in mind
 - Original articles on frameworks
 - Systematic reviews of Implementation Research frameworks
 - Talk to implementation researchers
- Excellent resource for theory and models commonly used: “Theory at a Glance” NCI monograph, 2nd Edition, 2005

Figure 10.

Using Theory to Plan Multilevel Interventions

<i>Change Strategies</i>	<i>Examples of Strategies</i>	<i>Ecological Level</i>	<i>Useful Theories</i>
 <p>Change People's Behavior</p> <p>Change the Environment</p>	<ul style="list-style-type: none"> • Educational sessions • Interactive kiosks • Print brochures • Social marketing campaigns 	Individual	Stages of Change Precaution Adoption Process Health Belief Model Theory of Planned Behavior
	<ul style="list-style-type: none"> • Mentoring programs • Lay health advising 	Interpersonal	Social Cognitive Theory
	<ul style="list-style-type: none"> • Media advocacy campaigns • Advocating changes to company policy 	Community	Communication Theory Diffusion of Innovations Community Organizing

Some considerations when selecting a framework (Tabak et al 2012)

- Many implementation frameworks to choose from (Meyers et al review 2012)
 - Commonly used frameworks: PARIHS, RE-AIM, CFIR, PRECEDE/PROCEED, etc!
- What levels/units of change are you interested in?
 - Individual, provider, organization, community, system
- Examine whether the framework you are interested in has *measures* associated with it

How to use your theory & framework

- Identify theory and framework EARLY in process of developing project/writing grant
- Discuss each component of the framework and how you will address it
 - Activities
 - Measures
 - Analysis
- Refer back to your framework throughout the course of implementation
- Draw on your framework for interpretation and presentation of study findings
- Compare and contrast your results with others who have used the same framework (if applicable)

10 key ingredients to a IR grant, Proctor *et al.* 2012

Proposal ingredient	Key question
1. The care gap or quality gap	The proposal has clear evidence that a gap in quality exists?
2. The evidence-based treatment to be implemented	Is the evidence for the program, treatment, or set of services to be implemented demonstrated?
3. Conceptual model and theoretical justification	The proposal delineates a clear conceptual framework/theory/model that informs the design and variables being tested?

10 key ingredients to a IR grant, Proctor *et al.* 2012 (cont.)

Proposal ingredient	Key question
4. Stakeholder priorities, engagement in change	Is there a clear engagement process of the stakeholder in place?
5. Setting's readiness to adopt new services/treatments/programs	Is there clear information that reflects the settings readiness, capacity, or appetite for change, specifically around adoption of the proposed evidence-based intervention?
6. Implementation strategy/process	Are the strategies to implement the intervention clearly defined, and justified conceptually?

10 key ingredients to a IR grant, Proctor *et al.* 2012 (cont.)

Proposal ingredient	Key question
7. Team experience with the setting, treatment, implementation process	Does the proposal detail the team's experience with the study setting, the intervention whose implementation is being studied, and implementation processes?
8. Feasibility of proposed research design and methods	Does the methods section of the proposal contain sufficient detail to understand what is being proposed, as well as address what will happen should methods not work as planned ?

10 key ingredients to a IR grant, Proctor *et al.* 2012 (cont.)

Proposal ingredient	Key question
9. Measurement and analysis section	<p>Does the proposal clarify the key constructs to be measured corresponding to the overarching conceptual model and theory?</p> <p>Is a measurement plan clear for each construct?</p> <p>Does the analysis section demonstrate how relationships between constructs will be tested?</p>
10. Policy/funding environment: leverage or support for sustaining change	<p>Does the proposal address how the implementation initiative aligns with policy trends?</p>

Additional Resources

- **Excellent publication on behavior change theories:** Theory at a Glance – A Guide For Health Promotion Practice (Second Edition)
- **Online courses UCSF CTSI Implementation Science :** <https://accelerate.ucsf.edu/training/implementation-science/theory-design>
- **Excellent book:** The Behaviour Change Wheel: A Guide To Designing Interventions Susan Michie
- **Helpful manual from World Health Organization:** Implementation Research in Health: A Practical Guide 2013
- **Example of an implementation science study and publication:** Fairall, L., et al., Task shifting of antiretroviral treatment from doctors to primary-care nurses in South Africa (STRETCH): A pragmatic, parallel, cluster-randomised trial. Lancet, 2012: p. 889-898.