

Implementation Strategies

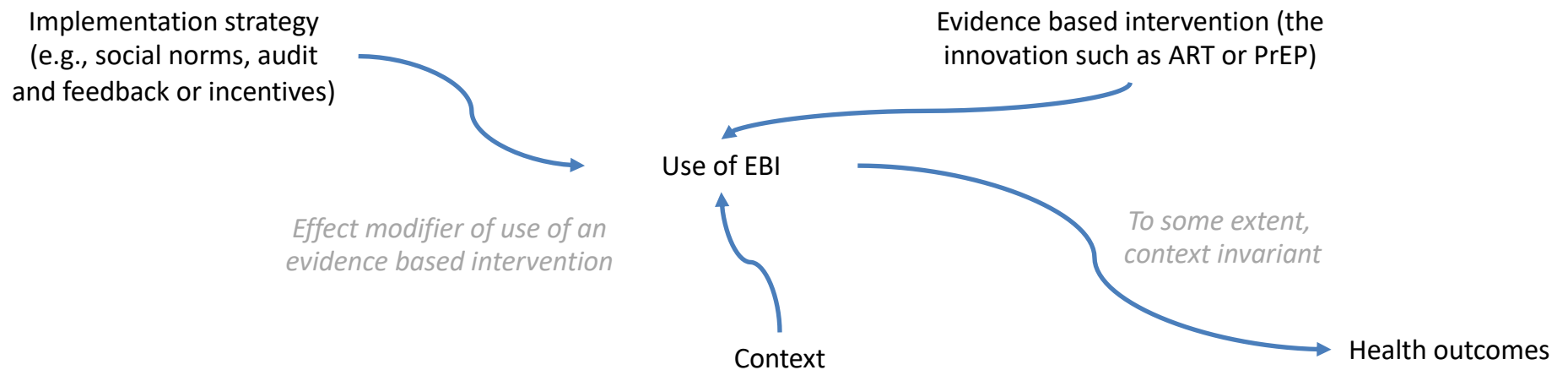
Elvin Geng
Epidemiology 239
Spring 2019

Overview: Week 4

- Describe distinctive challenges to conceptualization of implementation strategies
- Describe a framework for understanding implementation strategies
- Offer an epidemiological definition of an implementation strategy
- Illustrate use of this framework to dissect interventions and strategies
- Describe consequences of inadequate conceptualization of implementation interventions

What are Implementation Strategies?

- Proctor:
 - *“Implementation strategies...constitute the ‘how to’ component of changing healthcare practice”*
 - *“...the specific means or methods for adopting and sustaining interventions...”*
- Something done to close the gap between evidence and practice
 - Evidence-based clinical intervention might be dolutegravir and Truvada for HIV infection (non-toxic, potent)
 - An “implementation strategy” might be adherence counseling using motivational interviewing techniques to increase adherence to that medication



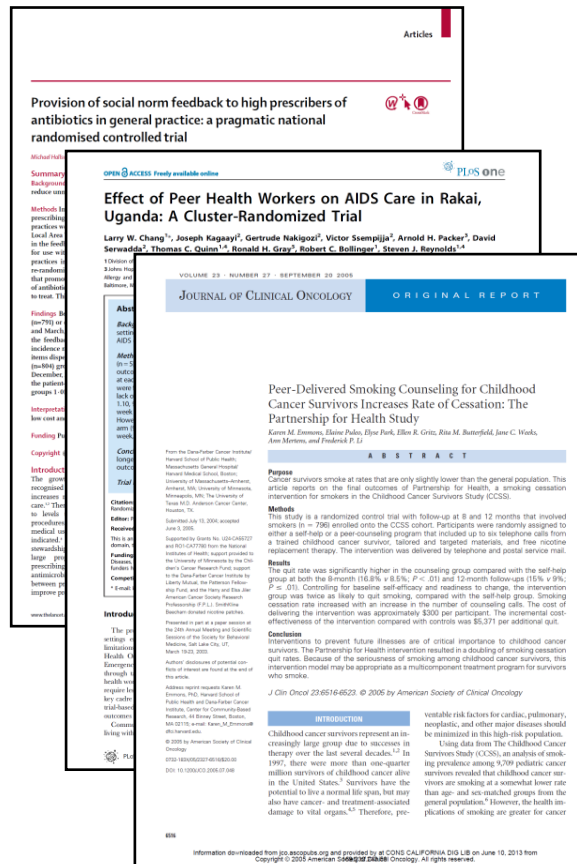
- There is always an evidence based intervention in the picture, so that an implementation strategy's effects are generally specific to a particular evidence based intervention.
 - Implies there is no single effect of any implementation strategy devoid of its relationship to an intervention (is it coherent to talk about the effect of incentives of cervical cancer screening, hypertension treatment, weight reduction, and HIV adherence? maybe, but probably not).
- The presence of context as a driver of the use of the EBI (and its absence on health outcomes), implies that the effect of implementation strategies is largely context dependent
 - Absence of context as a driver of health outcomes implies that effects, given use, are largely invariant (e.g., vaccine or ART)

Implementation Strategies

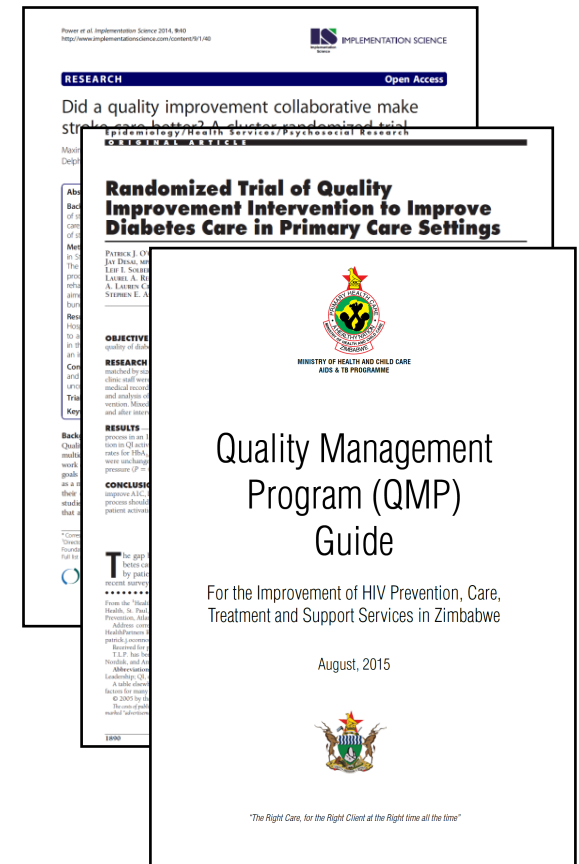
Incentives



Social Networks

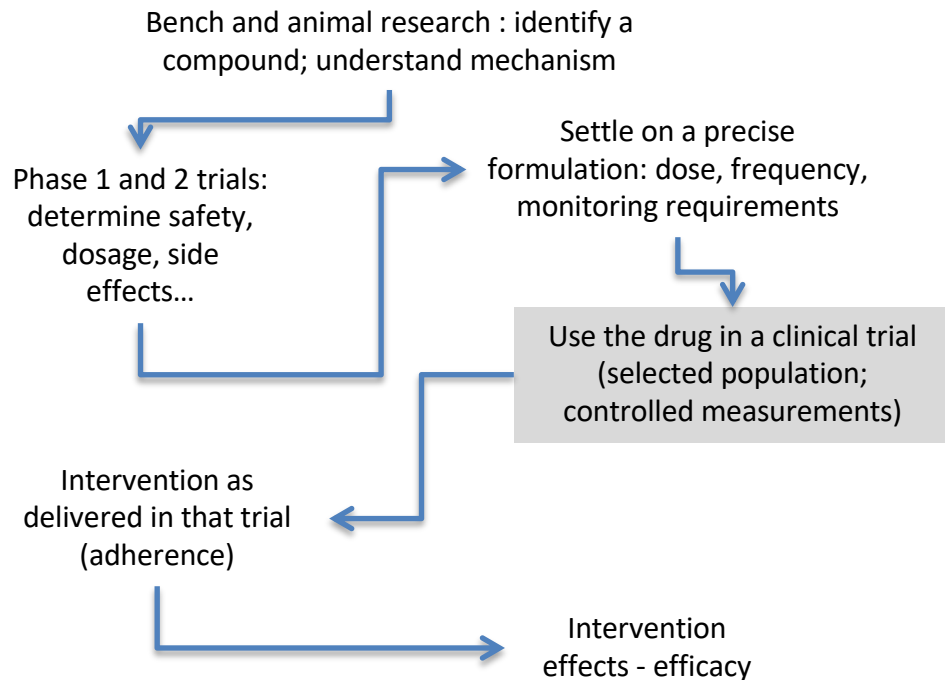


Quality Improvement

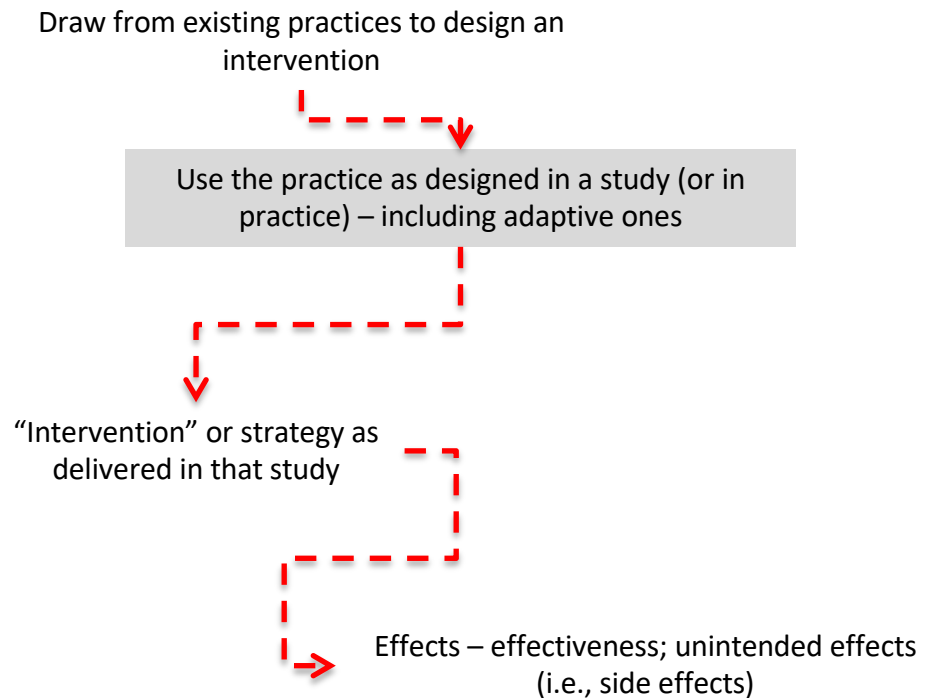


Why are Implementation Strategies Tricky?

Traditional Clinical Intervention (often a pharmacologic intervention)



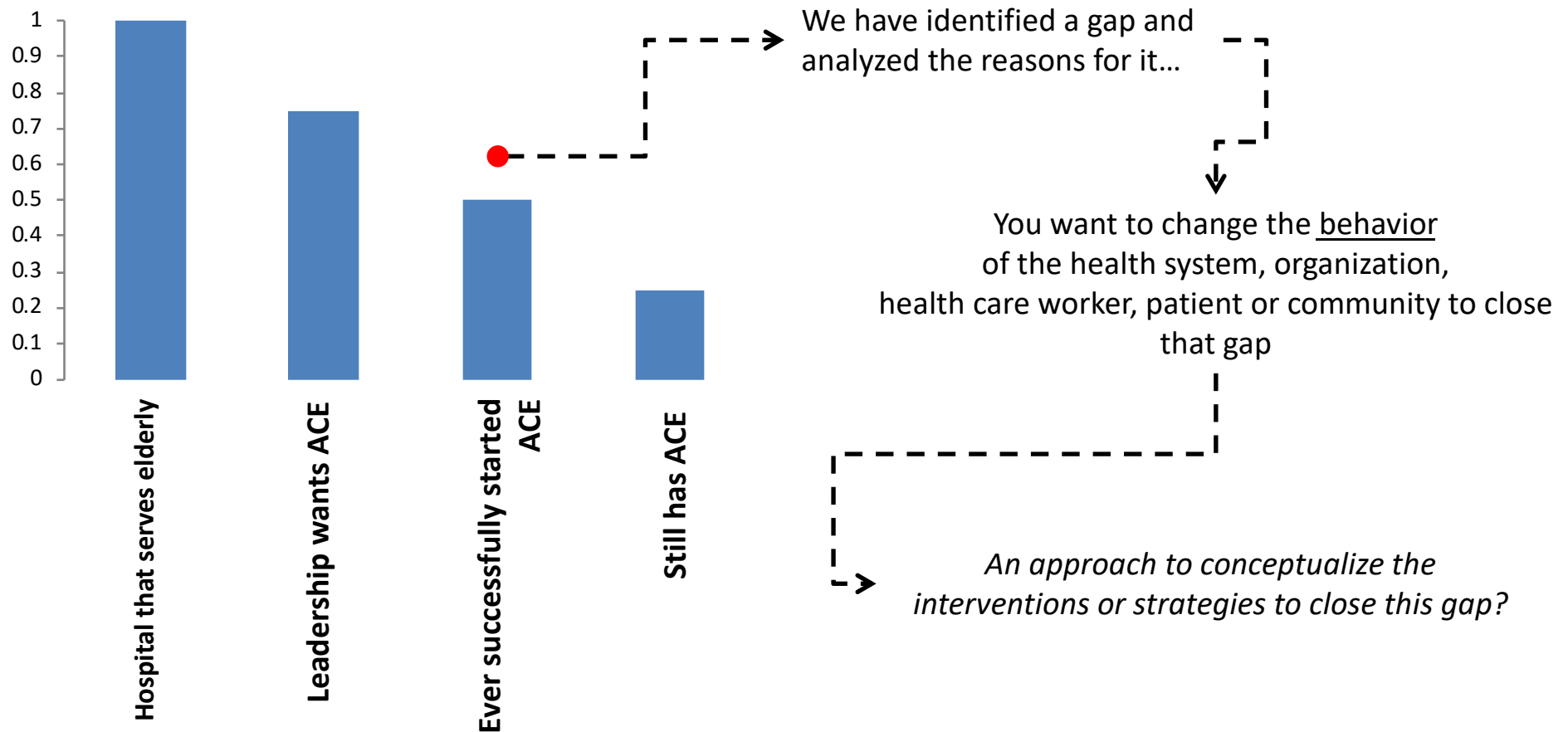
Implementation Strategy (often a behavioral intervention)



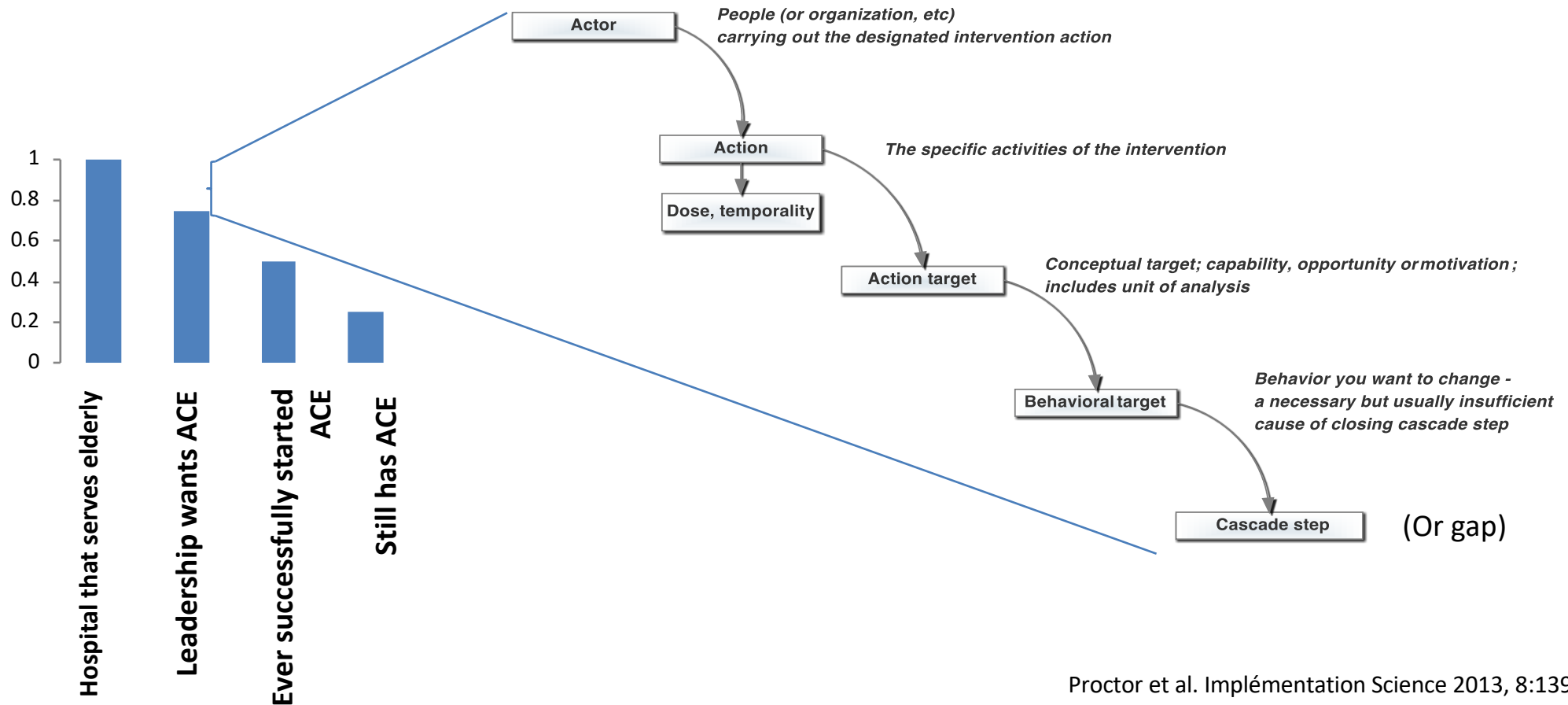
Distinctive Challenges for Implementation Strategies

- Implementation strategies are often not fully conceptualized nor specified
 - Dose, frequency, intensity are not “prerequisites”
- How implementation strategies work is less understood
 - “Mechanism” of effect incompletely known *a priori*
- Difference between interventions as (originally) designed and as delivered
 - Sometimes that is good - adaptivity
 - Sometimes not good - fidelity
- There is more uncertainty about effects
 - intended and unintended effects

From Gap, to Gap Analysis, to Implementation Intervention



Conceptualizing and specifying implementation interventions (example)

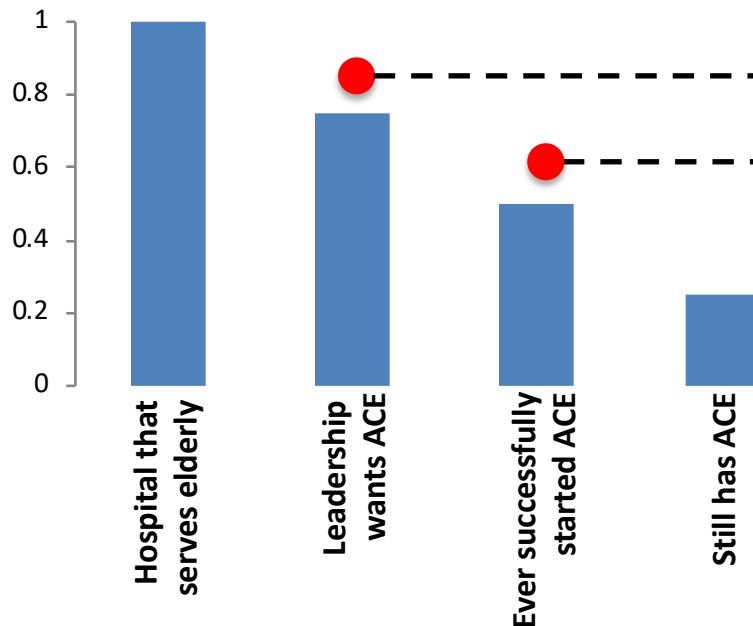


Actor

Generalizable characterization of “actor”

- Socio-demographics
- Training, education (e.g., nurse)
- Position (e.g., middle manager)
- Identity (e.g., peer)
- Sociometrically (e.g., opinion leader)

Knowledge / motivation gap:
Leadership does not know or care
about ACE – **“actor” might be an
advocacy organization or a branch of
an advocacy organization (AARP).**

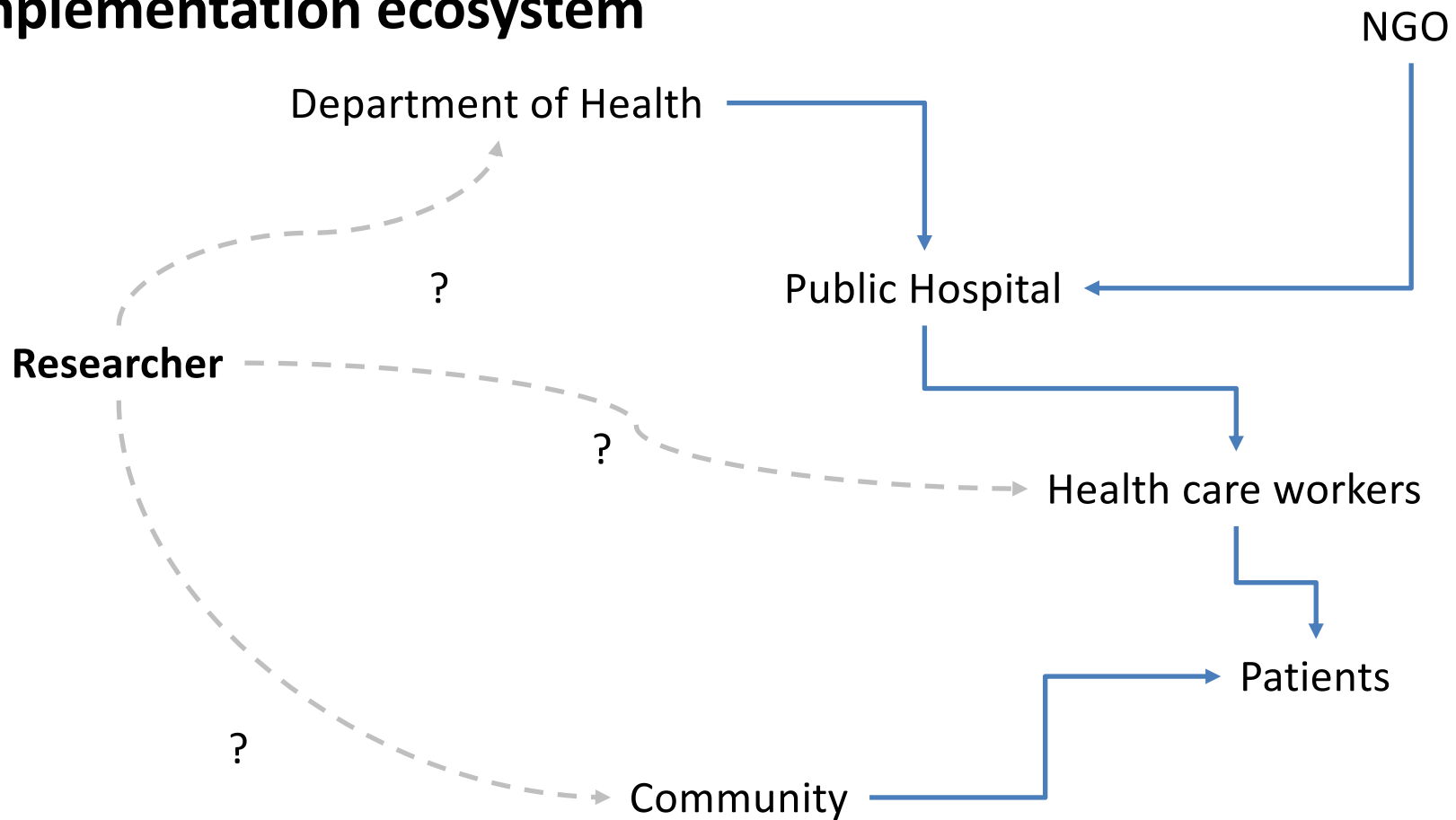


Technical gap: Leadership wants it
but doesn't know how to get it done
– **“actor” could be a professional
with X training who occupies a new
“seconded” position (e.g., QI for
HIV - HRSA)**

The Actor

- Who is the actor?
 - The stakeholder or actor in an implementation ecosystem who would carry out the intervention in reality
 - Often some title, unit, organization
 - Facilitates “translatability” into reality
 - Can also be a “new” position / person / unit
 - QI focal person in African Ministries of Health AIDS Programs
 - Need to take care that it is “realistic”

Researcher (carrying out research) and actor in an implementation ecosystem

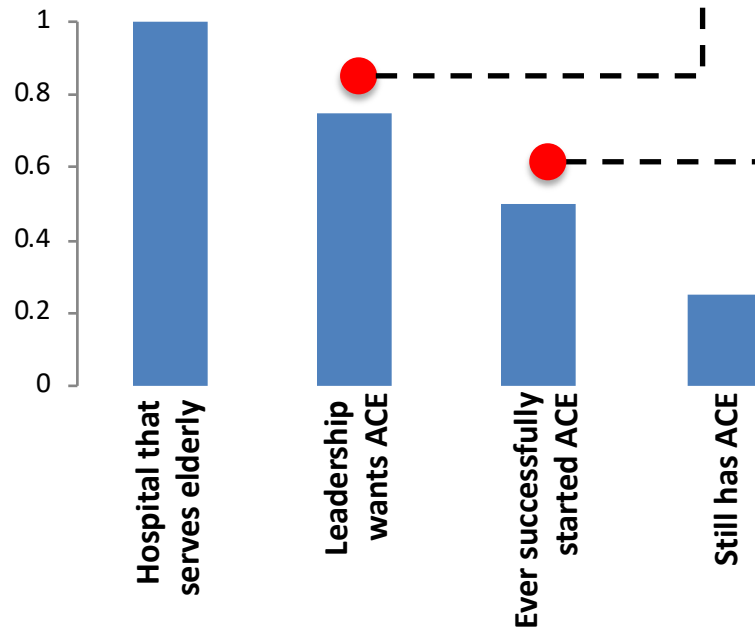


Integration of Researcher with Actor

- Whatever you seek to do as a researcher should be through “native” actor
- The extent to which the researcher acts as or through an actor implies the amount of change you want to introduce into a system
- No right answer
 - Too much change: unrealistic and “pedantic”
 - Too little: unlikely to have notable effects compared to present standard practice
- Example
 - Work with program management to influence the behavior of peer educators in an HIV program in Africa
 - Use existing relationships (technical support teams)

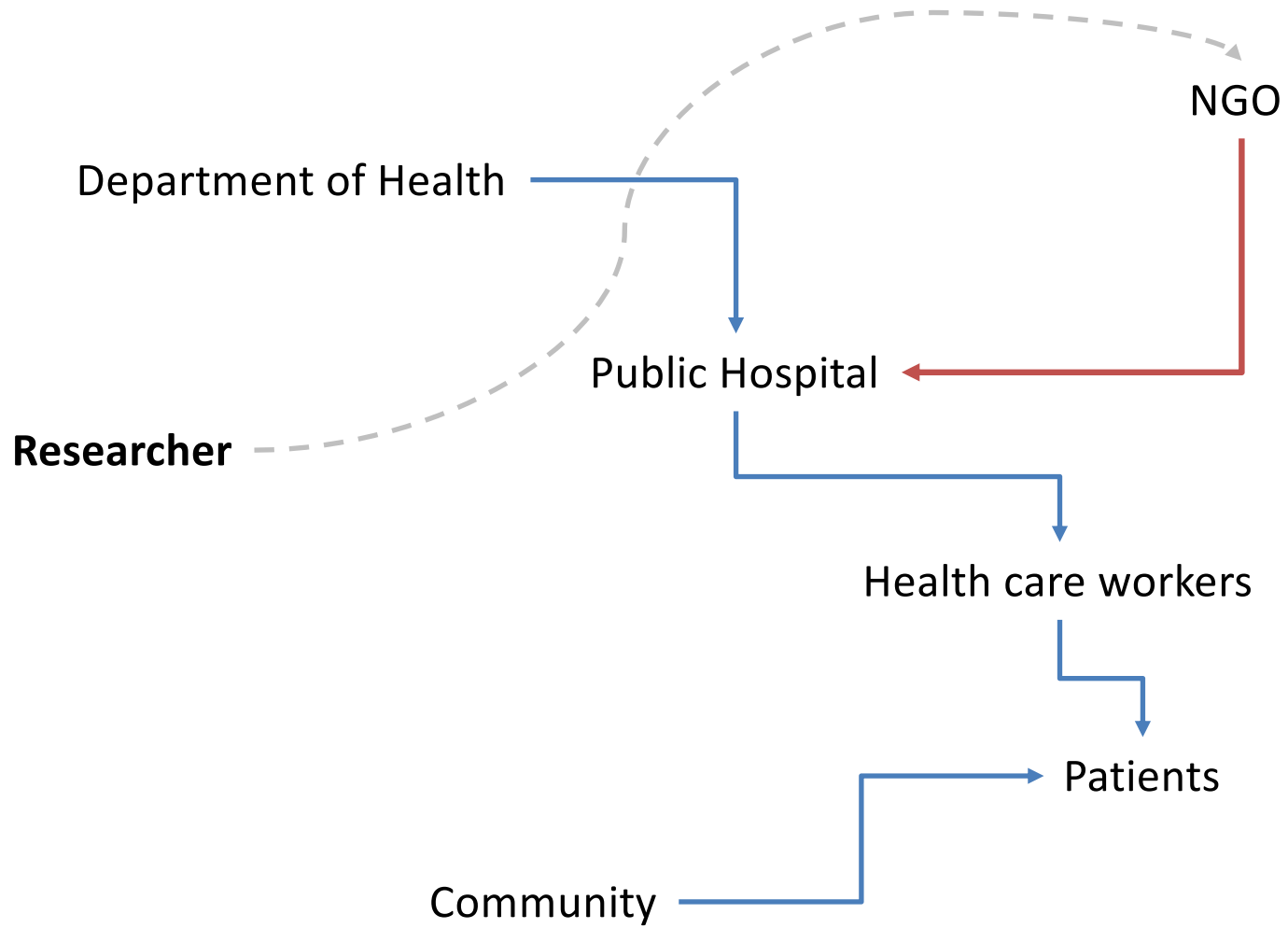
Action

“An active verb statements to specify the specific actions, steps, or processes that need to be enacted” (e.g., train, educate, persuade, motivate) (BCW)



Knowledge / motivation gap: Leadership does not know or care about ACE – “actor” might be an advocacy organization or a branch of an advocacy organization (AARP) which seeks to **persuade through petition letters and reputational incentive (website that shows facilities with and without ACE)**

Technical gap: Leadership wants it but doesn't know how to get it done – “actor” could be a professional with X training who occupies a new “seconded” position (e.g., QI for HIV - HRSA seconds) which **seeks to engage, motivate and train colleagues on a committee**



Dose and Temporality of Action

Knowledge / motivation gap: Leadership does not know or care about ACE – “actor” might be an advocacy organization or a branch of an advocacy organization (AARP) which seeks to **persuade through petition letters and reputational incentive (website that shows facilities with and without ACE)** (which are delivered monthly and available continuously, respectively)

Technical gap: Leadership wants it but doesn't know how to get it done – “actor” could be a professional with X training who occupies a new “seconded” position (e.g., QI for HIV - HRSA seconds) which **seeks to engage, motivate and train colleagues on a committee - delivered at weekly meetings and prn as opportunities arise**

Dose Matters?

- 431 patients HIV on ART
- Randomized to text messages that were weekly or daily
- MEMS
- 90% adherence by week 48
 - 40% in control
 - 41% in daily (p = NS)
 - 53% in weekly (p < 0.05)

Mobile phone technologies improve adherence to antiretroviral treatment in a resource-limited setting: a randomized controlled trial of text message reminders

Cristian Pop-Eleches^{a,b,*}, Harsha Thirumurthy^{c,d,*},
James P. Habyarimana^{e,*}, Joshua G. Zivin^f, Markus P. Goldstein^g,
Damien de Walque^h, Leslie MacKen^h, Jessica Haberer^{i,o},
Sylvester Kimaiyo^j, John Sidle^{k,l}, Duncan Ngare^m and
David R. Bangsberg^{n,p}

Objective: There is limited evidence on whether growing mobile phone availability in sub-Saharan Africa can be used to promote high adherence to antiretroviral therapy (ART). This study tested the efficacy of short message service (SMS) reminders on adherence to ART among patients attending a rural clinic in Kenya.

Design: A randomized controlled trial of four SMS reminder interventions with 48 weeks of follow-up.

Methods: Four hundred and thirty-one adult patients who had initiated ART within 3 months were enrolled and randomly assigned to a control group or one of the four intervention groups. Participants in the intervention groups received SMS reminders that were either short or long and sent at a daily or weekly frequency. Adherence was measured using the medication event monitoring system. The primary outcome was whether adherence exceeded 90% during each 12-week period of analysis and the 48-week study period. The secondary outcome was whether there were treatment interruptions lasting at least 48 h.

Results: In intention-to-treat analysis, 53% of participants receiving weekly SMS reminders achieved adherence of at least 90% during the 48 weeks of the study, compared with 40% of participants in the control group ($P=0.03$). Participants in groups receiving weekly reminders were also significantly less likely to experience treatment interruptions exceeding 48 h during the 48-week follow-up period than participants in the control group (81 vs. 90%, $P=0.03$).

Conclusion: These results suggest that SMS reminders may be an important tool to achieve optimal treatment response in resource-limited settings.

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^aSchool of International and Public Affairs, ^bDepartment of Economics, Columbia University, New York, New York, ^cDepartment of Health Policy and Management, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, ^dThe World Bank, ^ePublic Policy Institute, Georgetown University, Washington, District of Columbia, ^fSchool of International Relations and Pacific Studies, University of California, San Diego, California, ^gDevelopment Research Group, The World Bank, ^hBureau for Global Health, United States Agency for International Development, Washington, District of Columbia, ⁱDepartment of Medicine, Massachusetts General Hospital, Boston, Massachusetts, USA, ^jSchool of Medicine, Moi University, Eldoret, Kenya, ^kDivision of General Internal Medicine, Indiana University School of Medicine, Indianapolis, Indiana, USA, ^lDepartment of Medicine, Faculty of Health Sciences, ^mSchool of Public Health, Moi University, Eldoret, Kenya, ⁿRagon Institute of MGH, MIT and Harvard, ^oMassachusetts General Hospital Center for Global Health, Boston, Massachusetts, USA, and ^pMbarara University of Science and Technology, Mbarara, Uganda.

Correspondence to Harsha Thirumurthy, PhD, The World Bank, 1818 H Street NW, Washington, DC 20433, USA.

E-mail: hthirumurthy@worldbank.org; hthir@unc.edu

*C.P.-E., H.T. and J.P.H. contributed equally to the writing of this article.

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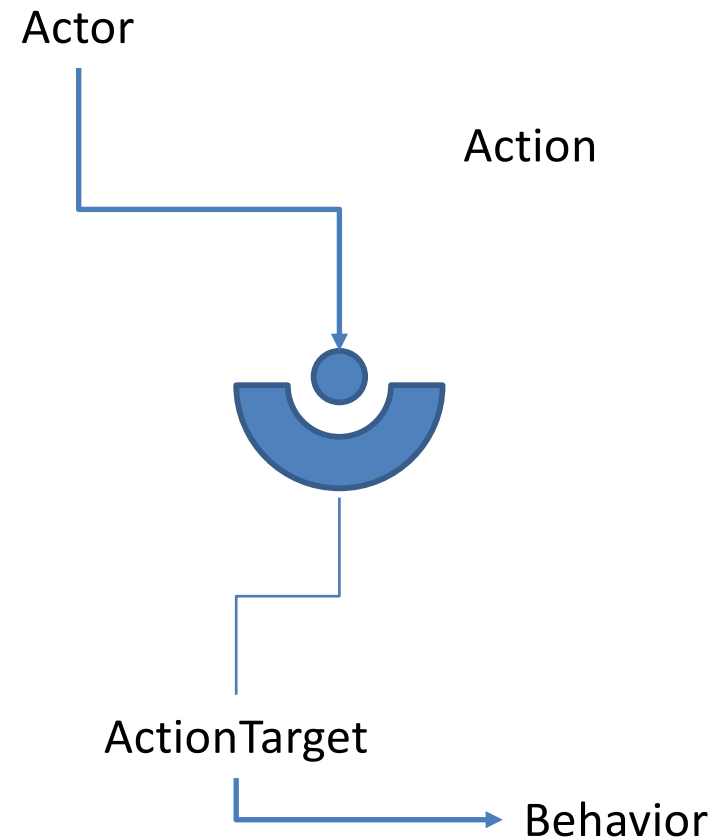
DOI:10.1097/QAD.0b013e32834380c1

Dose Matters? Incentives

- Larger incentives
 - Small therapeutic window (gaming)
 - More ability to crowd out
 - Larger short term effect
- Why
 - Price point vs. present bias?
 - Ibuprofen
- Examples

Action Target

- The “receptor”
- The determinant of behavior
- ***Cannot directly act on behavior***
- Action target mediates between intervention actions and behaviors
- One schema: capability, opportunity, motivation (COMB)

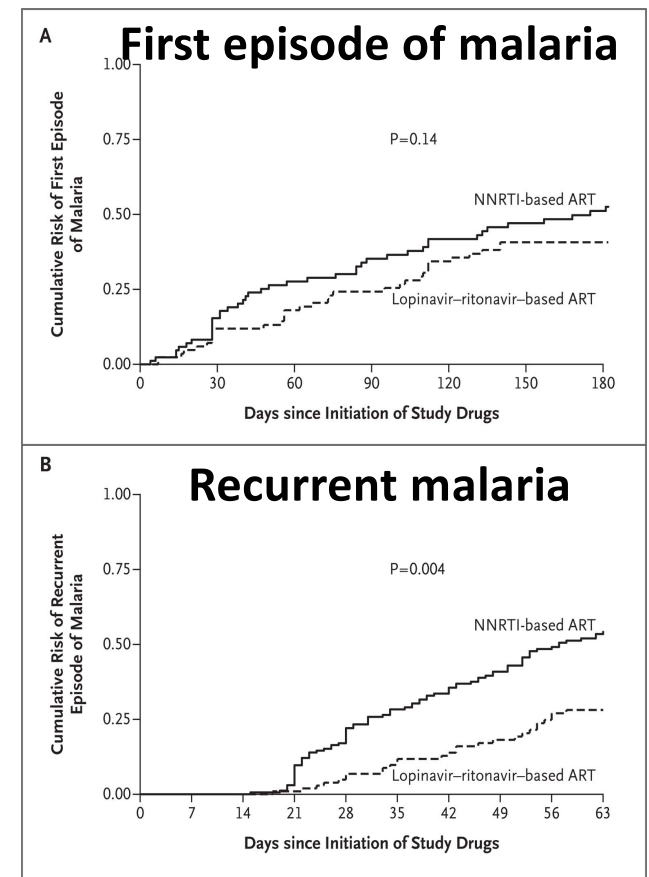


Examples

- A QI coach makes 2-hour visits each week to a clinic in order to train and thereby enhance capabilities of health care workers to
- The AARP ACE campaign unit sends petitions monthly to motivate hospital CMO's
- A state offered tax relief each year for the next five years to incentivize facilities to create analytic database tools

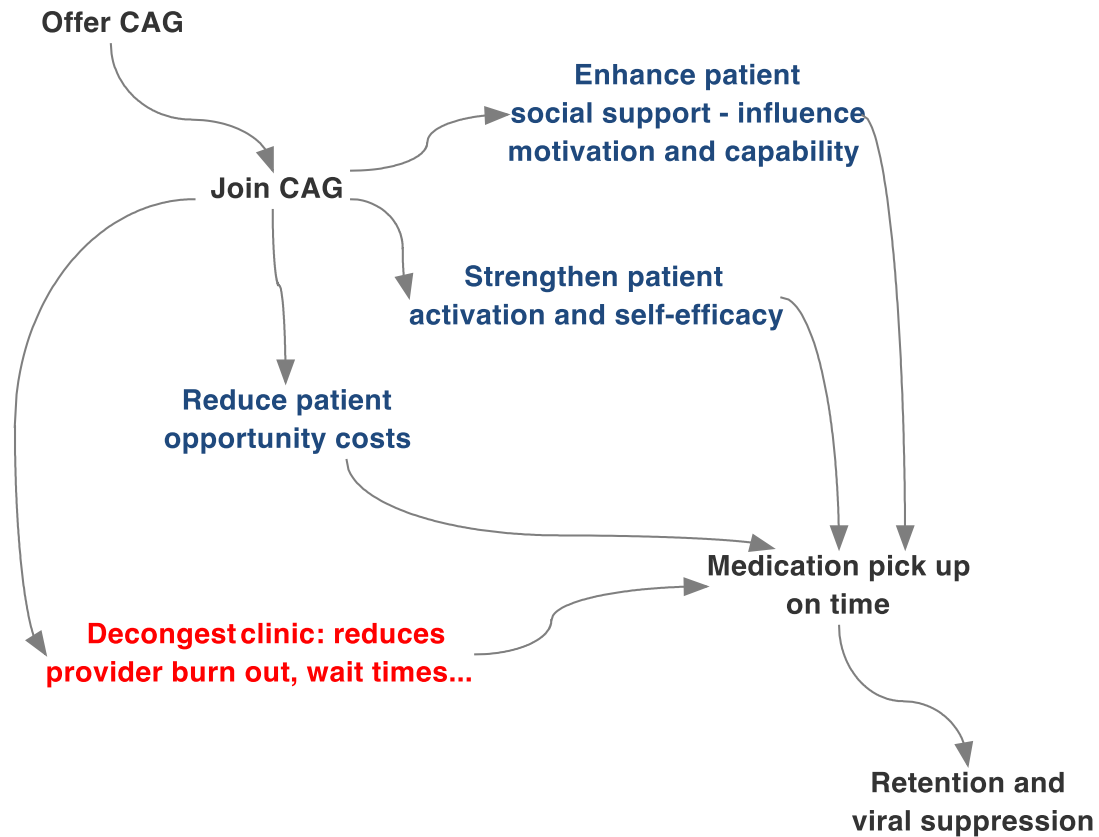
Action Target: Transportability

- Understanding action target (s) enables inference about results in one setting in another
- Illustration from clinical medicine
 - Protease inhibitors have anti *p. falciparum* effect
 - Protease inhibitors alter kinetic of anti-malarial drugs
- Mechanism informs generalizability
 - Direct anti-plasmodium effect → can expect the same effect in low prevalence areas
 - Boosting coartem → not transportable to low prevalence settings



Example from Implementation Studies

- Community adherence groups from Mozambique (Decroo JAIDS 2011)
- Problem: too many visits and clinics too crowded
- Solution
 - 6 members
 - Rotate clinic visit
- Reduces clinic visits from 12 to 2
- Where else will this work?



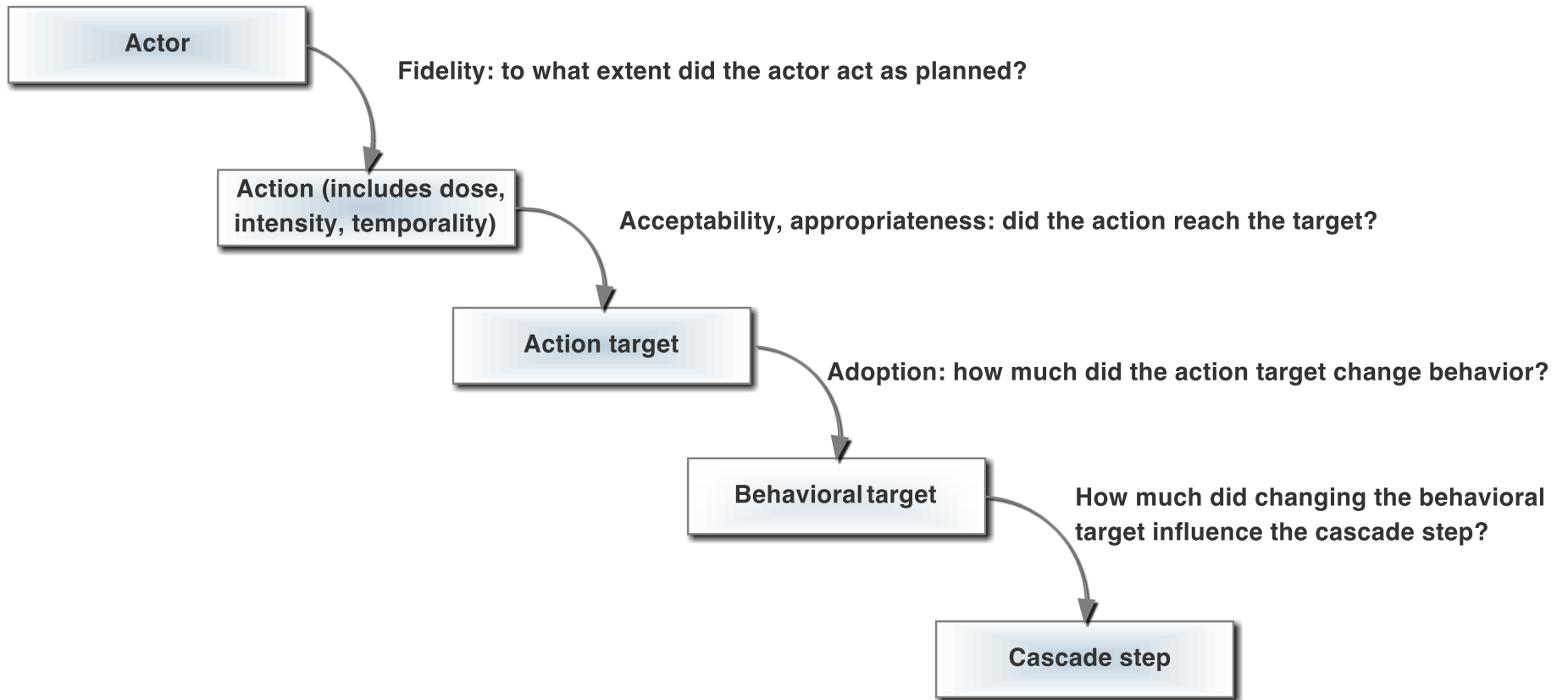
- What if you live close?
- What if you don't need social support?

Behavioral Target

- Behavior that you seek to change
- Necessary component but usually insufficient cause of closing cascade step
- Proctor offers acceptability, sustainability, adoptability, etc.
- Examples:
 - A **QI coach** makes 2-hour visits each week to a clinic in order to **train** and thereby **enhance capabilities of health care workers** to ***operate a quality committee***
 - The **AARP ACE campaign unit** sends petitions monthly to **motivate hospital CMO's** to ***allocate an FTE to leading an ACE scale up***
 - A **state** offered tax relief each year for the next five years to **incentivize facilities to create analytic database tools** ***that systematically reports incident kidney dysfunction***

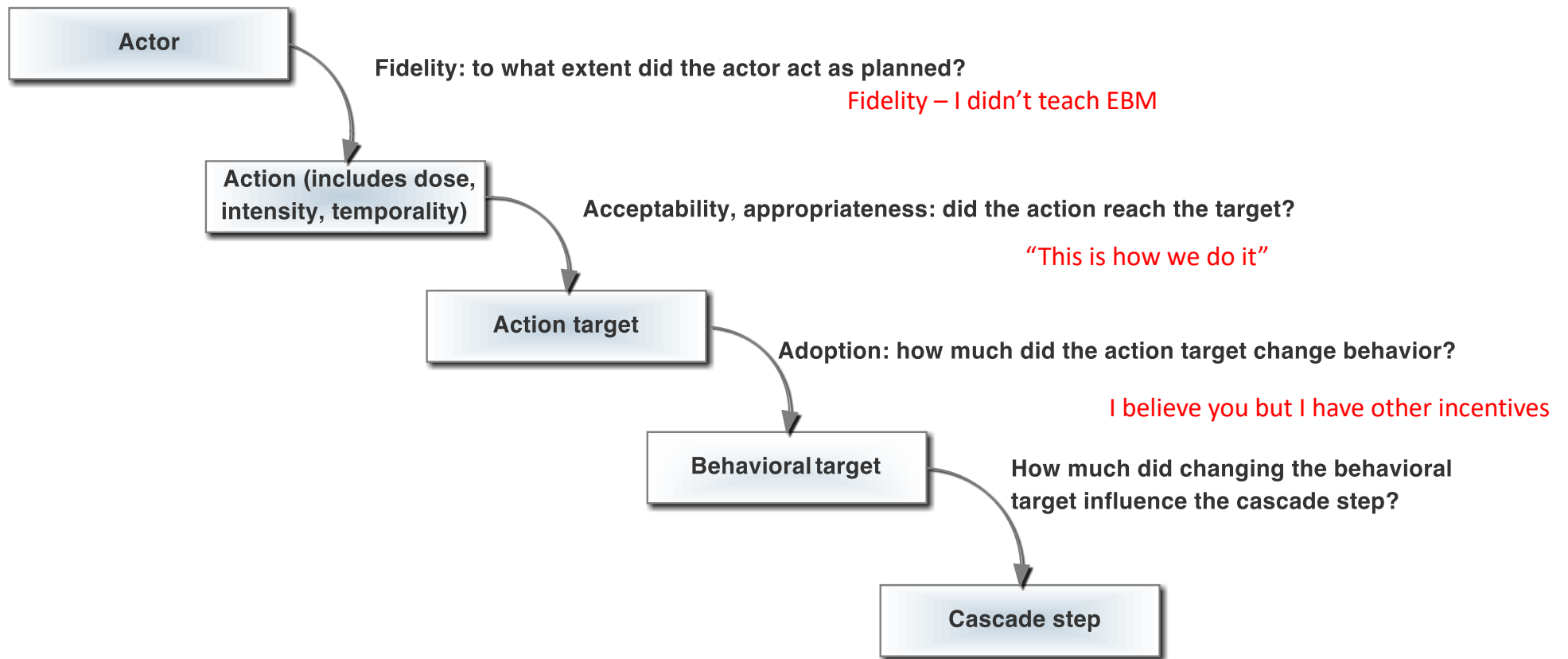
Implementation outcomes

- Acceptability
 - Adoption
 - Appropriateness
 - Costs
 - Feasibility
 - Fidelity
 - Penetration
 - Sustainability
- Implementation outcomes
 - Indicators of the implementation success.
 - Proximal indicators of implementation processes.
 - Key intermediate outcomes in relation to service system or clinical outcomes in treatment effectiveness

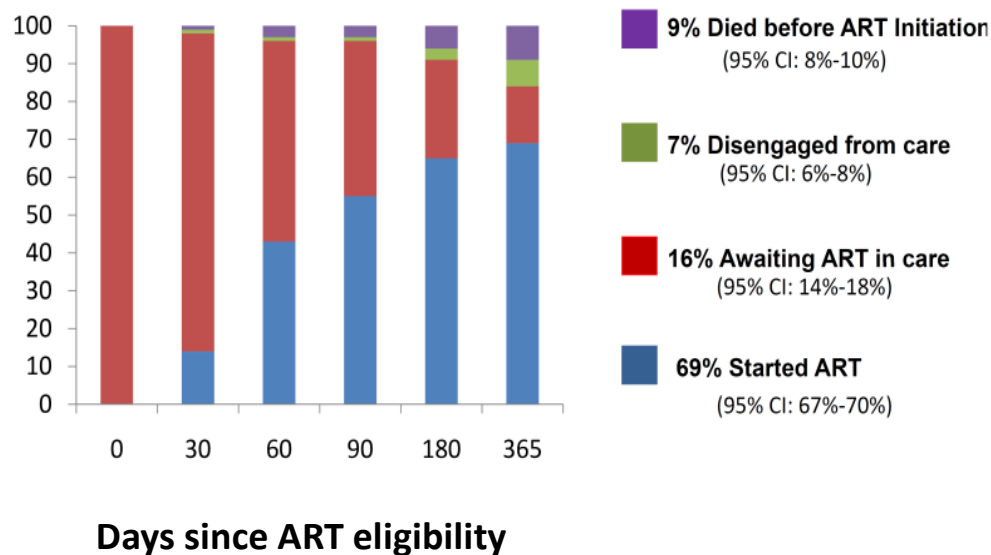


Example

- TA in China for HIV care
- Non-evidence based practices
 - Mannitol for cryptococcal meningitis
- 6 months intervention
 - International scholars, model evidence based practices, etc
 - Round with team
 - Doctor-to-doctor
- Measure mortality before and after
- No difference



Example: ART Initiation in Uganda



Structural

- Overnight processing of CD4 testing
- Failure to return for second visit

Organizational

- One size fits all counseling
- “treatment supporter” and three pre-ART adherence visit requirements

Providers

- Slow diffusion of new clinical research findings
- Unaware of new data suggesting timing matters (Zolopa 2009, Havlir 2011)
- “ART is not an emergency”

**Actor: opinion leader led
CME, POCCD4 & Feedback**

**Action: training, coaching and
incentivization of health care workers**

**Action dose, frequency: CME - once; coaching
- weekly then taper; POC-- once; feedback
- bi-annually**

**Action target: health care worker
knowledge, motivation and
opportunities to offer ART**

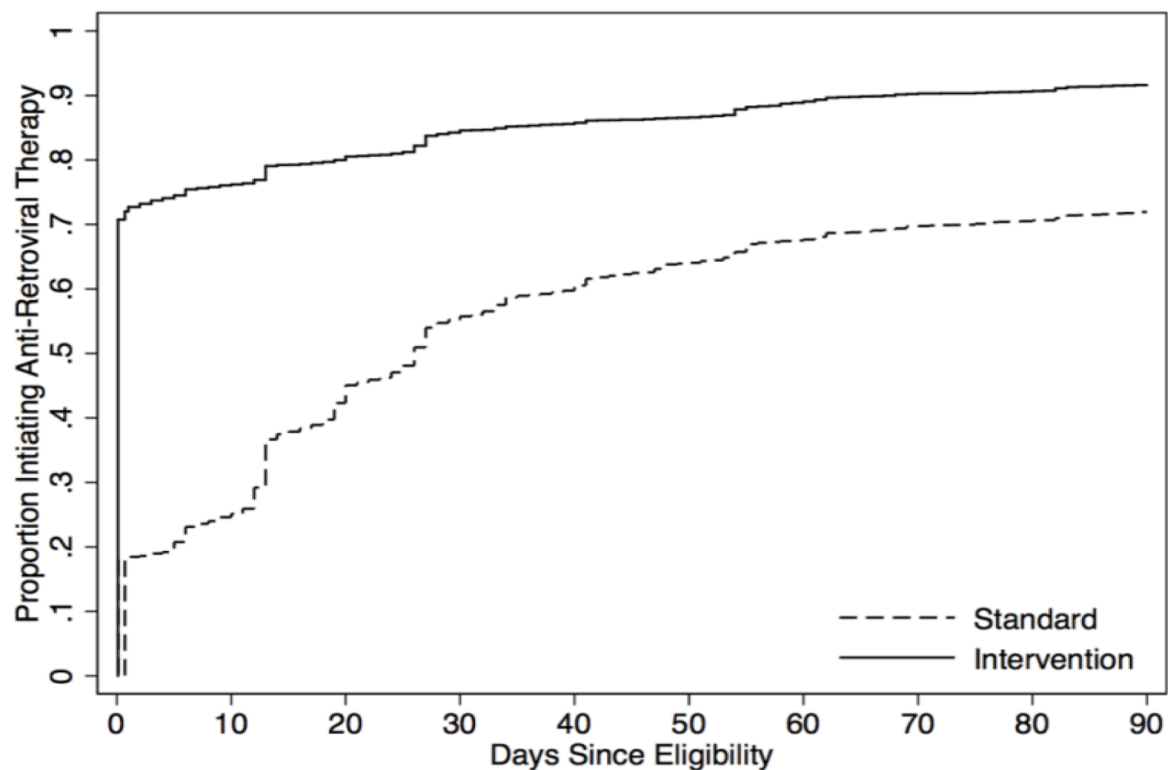
**Behavioral target:
health care worker
offer ART**

**Cascade target:
ART initiation**

Amanyire Lancet 2015

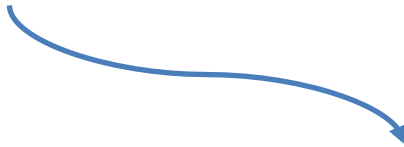
Primary outcome: ART initiation by 14 days after ART eligibility (N=12,024)

Cumulative Incidence of ART Initiation

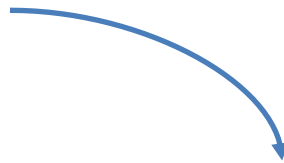


Implementation Interventions and Intervention Outcomes

Intervention



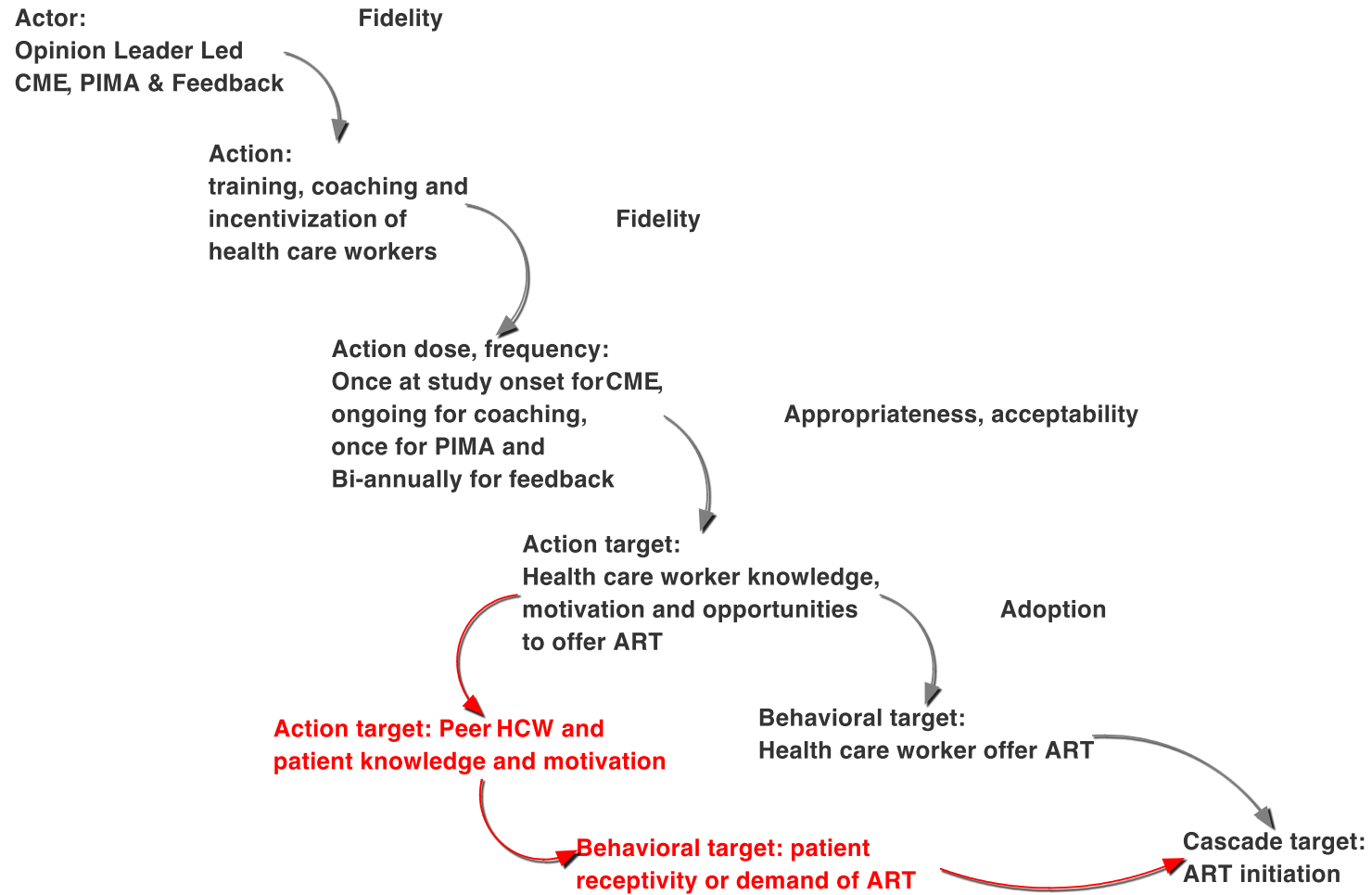
Implementation outcome



Process outcome



Health status outcome



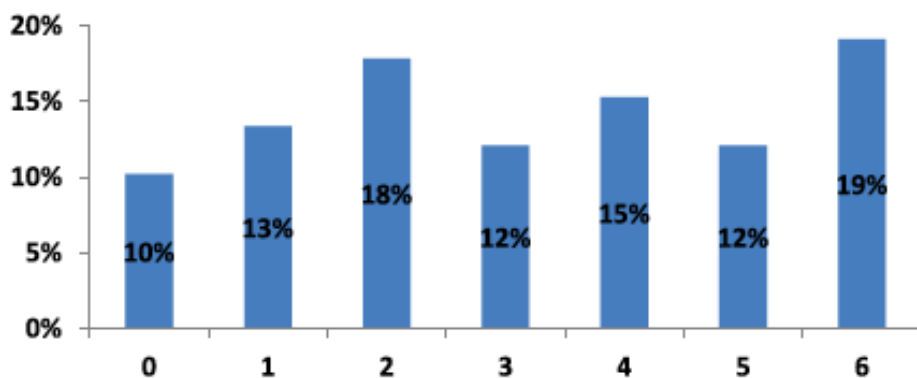
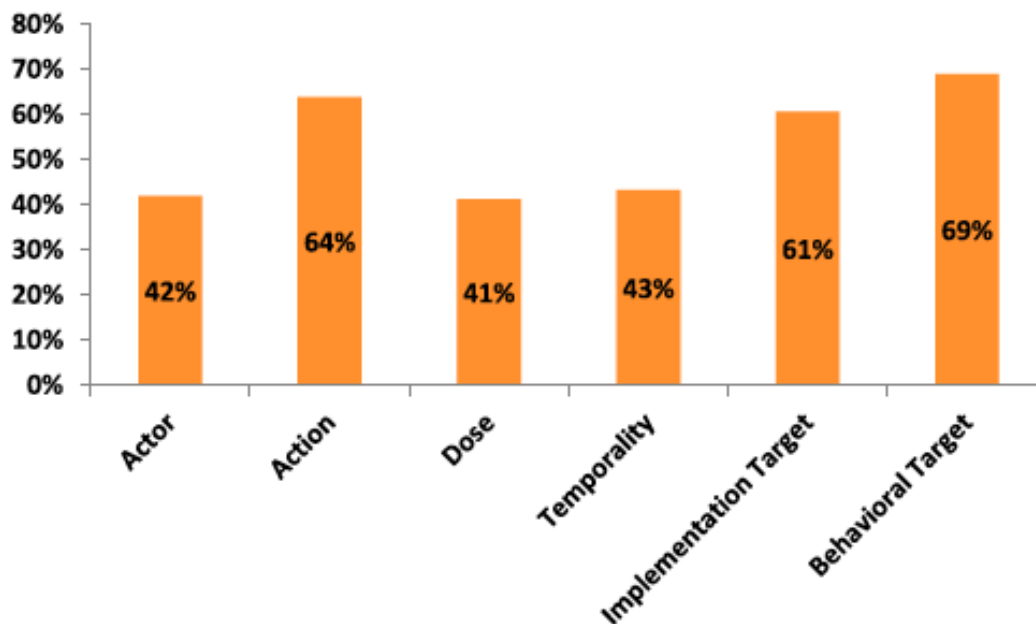
A**B**

Fig. 2 a Number of implementation parameters reported in each study (max 6, $N = 157$). **b** Prevalence of reporting of each implementation parameter in each study ($N = 157$)

<https://implementationscience.biomedcentral.com/articles/10.1186/s13012-017-0630-8>

Table 4 Completeness of reporting of Proctor-based intervention dimensions overall and by intervention approach

	Counseling	Demand creation	Infrastructure/man agement	Service delivery	Social/behavioral	Technology
Actor	54%	37%	49%	42%	35%	55%
Action	76%	78%	65%	59%	68%	83%
Dose	41%	52%	40%	36%	41%	62%
Temporality	49%	37%	60%	36%	32%	62%
Implementation target	68%	70%	53%	60%	71%	86%
Behavioral target	78%	89%	67%	63%	79%	76%
Mean score	3.6	3.6	3.3	3.0	3.3	4.2
Total <i>n</i> by column	37	27	43	81	34	29

Cells in which reporting is less than 50% are dark red. Cells in which reporting is between 50 and 75% are pink. Cells in which reporting is above 75% are white. Totals are mean score out of total possible score of 6

Table 6 Completeness of reporting of Proctor-based intervention dimensions overall and by HIV care cascade step

	Testing	Linkage	Staging	Initiation	Pre-ART retention	Retention on ART	Adherence
Actor	47%	64%	58%	52%	64%	44%	39%
Action	74%	79%	75%	61%	73%	51%	73%
Dose	37%	57%	58%	35%	64%	33%	57%
Temporality	34%	64%	75%	61%	64%	42%	47%
Implementation target	55%	64%	75%	58%	55%	56%	67%
Behavioral target	87%	86%	92%	81%	73%	45%	76%
Total score	3.3	4.1	4.3	3.5	3.9	2.7	3.6
Total <i>n</i> by column	38	14	12	31	11	55	49

Cells in which reporting is less than 50% are purple. Cells in which reporting is between 50 and 75% are pink. Cells in which reporting is above 75% are white

Post Script

- Must conceptualize and specify adequately
- This isn't "normal" yet
- Movement toward full conceptualization and reporting of strategies
- Journal reviewers and editors do not yet value specification of implementation strategies and outcomes