Advancing Sustainability Research within Implementation Science

Rachel C. Shelton, ScD, MPH

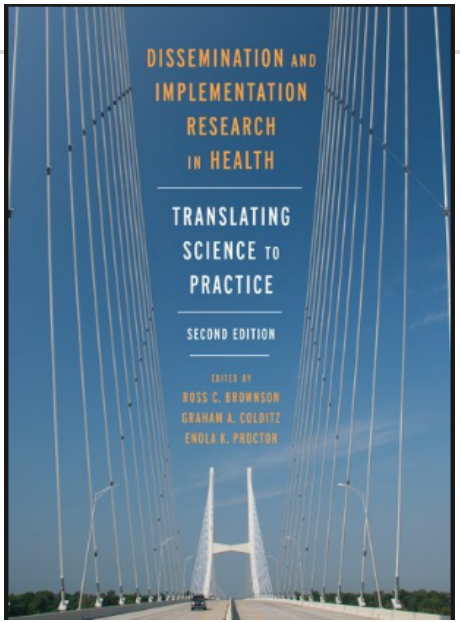
Associate Professor

Department of Sociomedical Sciences

Columbia University, Mailman School of Public Health

Director, Implementation Science Initiative, Columbia's Irving Institute/CTSA

Overview



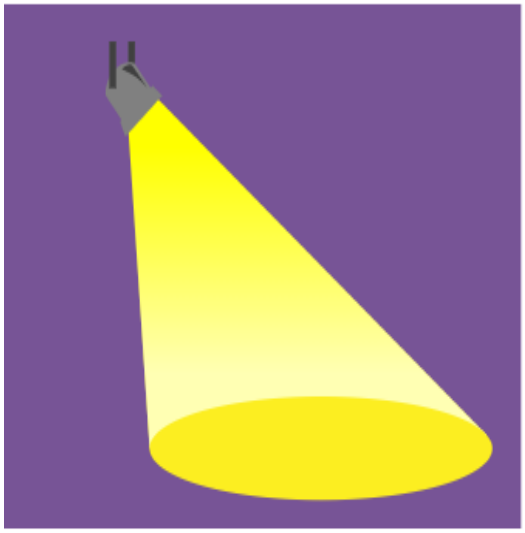
- Introduction to sustainability in implementation science
- Examples from my work with Lay Health Advisor Interventions (LHAs) to address cancer inequities
- Future directions/opportunities to advance sustainability research in the field

Dissemination Science

- Study of factors that lead to widespread adoptions of EBIs
- How to facilitate the uptake and adoption of EBIs

Implementation Science

- Studies strategies and factors that lead to successful integration of EBIs in specific settings
- How to embed EBIs in 'real-world' practice/ settings



Where does *sustainability* of evidence-based interventions fit in?

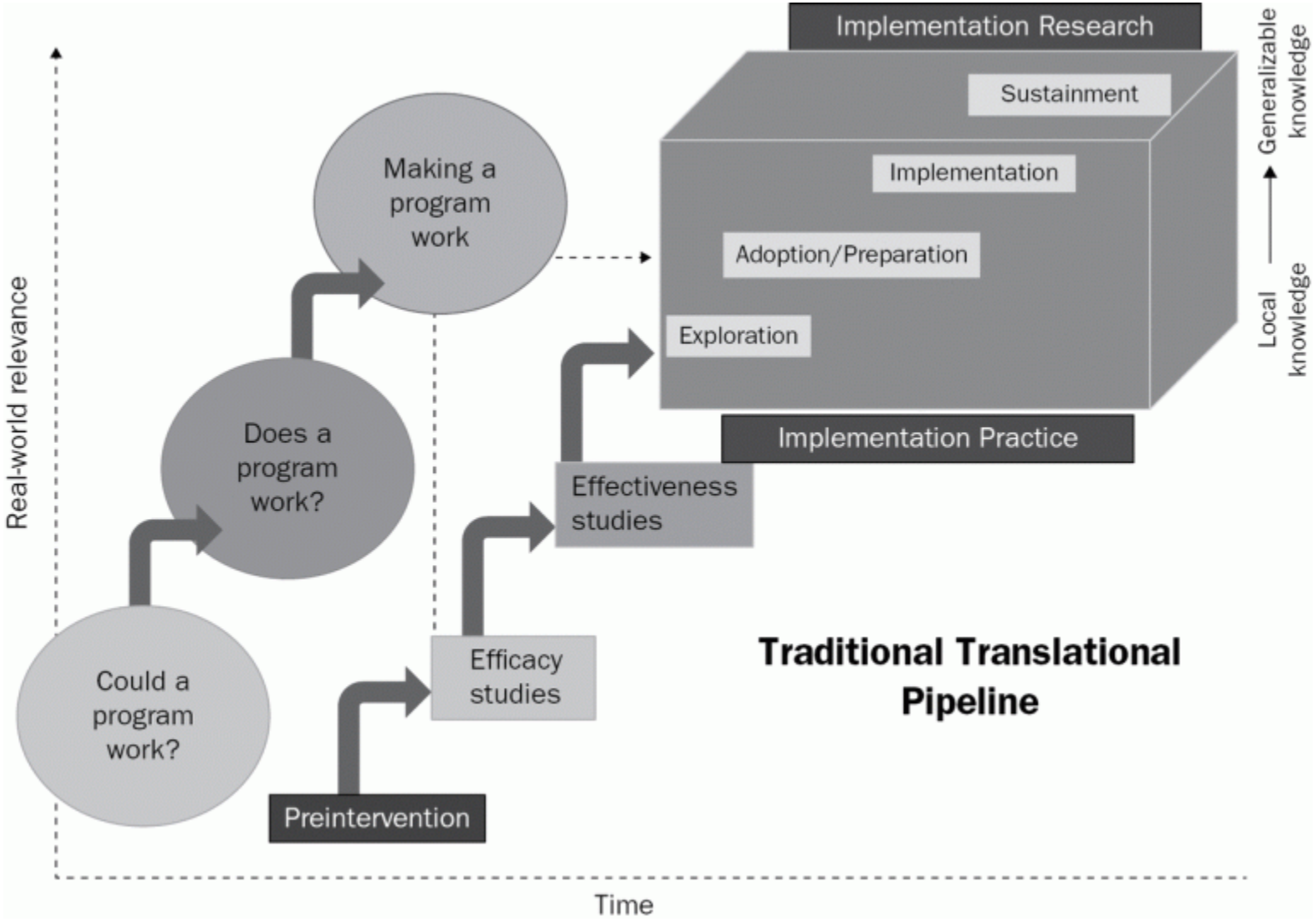
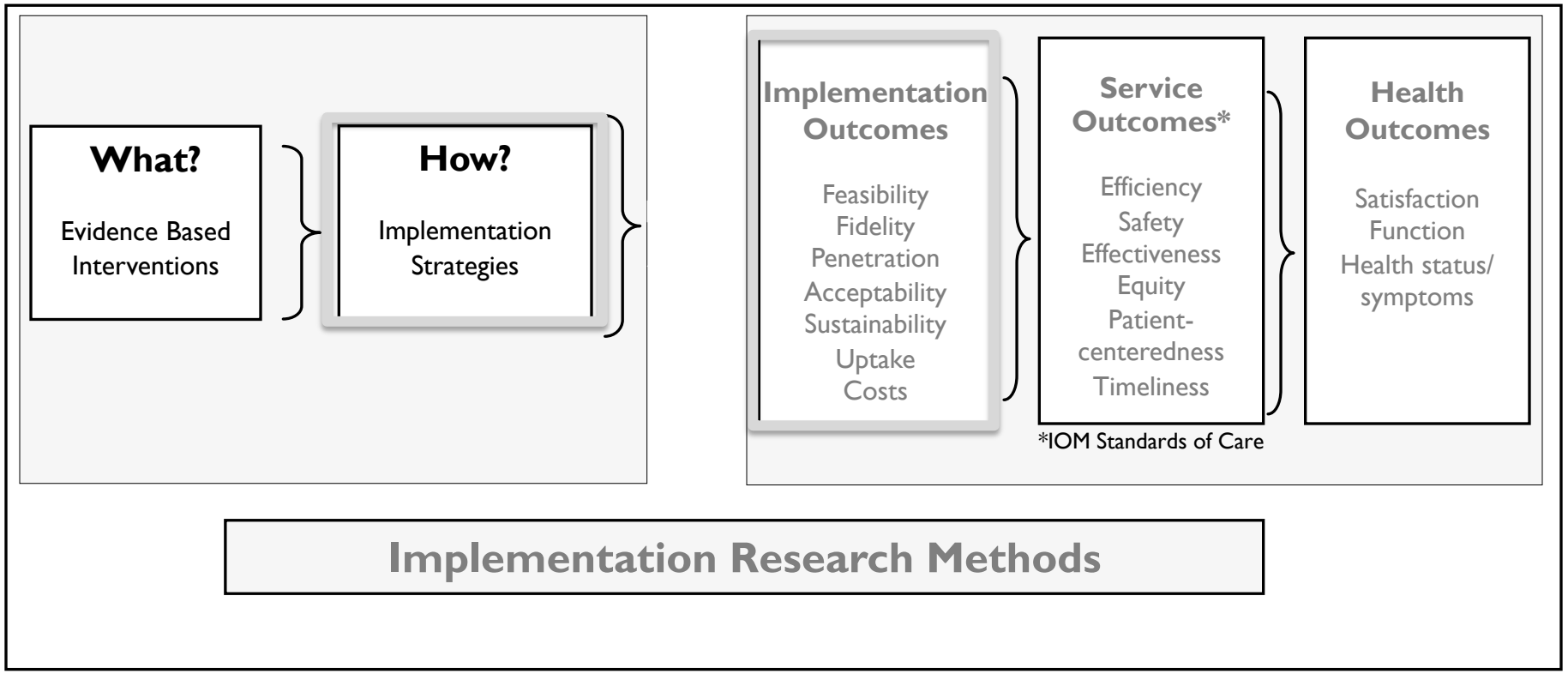


Figure 13.1 **Stages of research** and phases of dissemination and implementation.

Brownson, R. C., G.A. Colditz, and E. K. Proctor. 2018. *Dissemination and implementation research in health: Translating science to practice.*

Implementation Science Framework (Proctor et al. 2009)



Proctor, E. K., Landsverk, J., Aarons, G., Chambers, D., Glisson, C., & Mittman, B. (2009). Implementation Research in Mental Health Services: an Emerging Science with Conceptual, Methodological, and Training challenges. *Administration and Policy in Mental Health*

REACH
How do I reach the targeted population?
EFFECTIVENESS
How do I know my intervention is effective?
MAINTENANCE
How do I incorporate the intervention so it is delivered over the long term?
RE-AIM
Translating Research into Action
re-aim.org
ADOPTION
How do I develop the institutional support to deliver my intervention?
IMPLEMENTATION
How do I ensure the intervention is delivered properly?

Johnson et al. Implementation Science (2019) 14:50
https://doi.org/10.1186/s13012-019-0895-1

Implementation Science

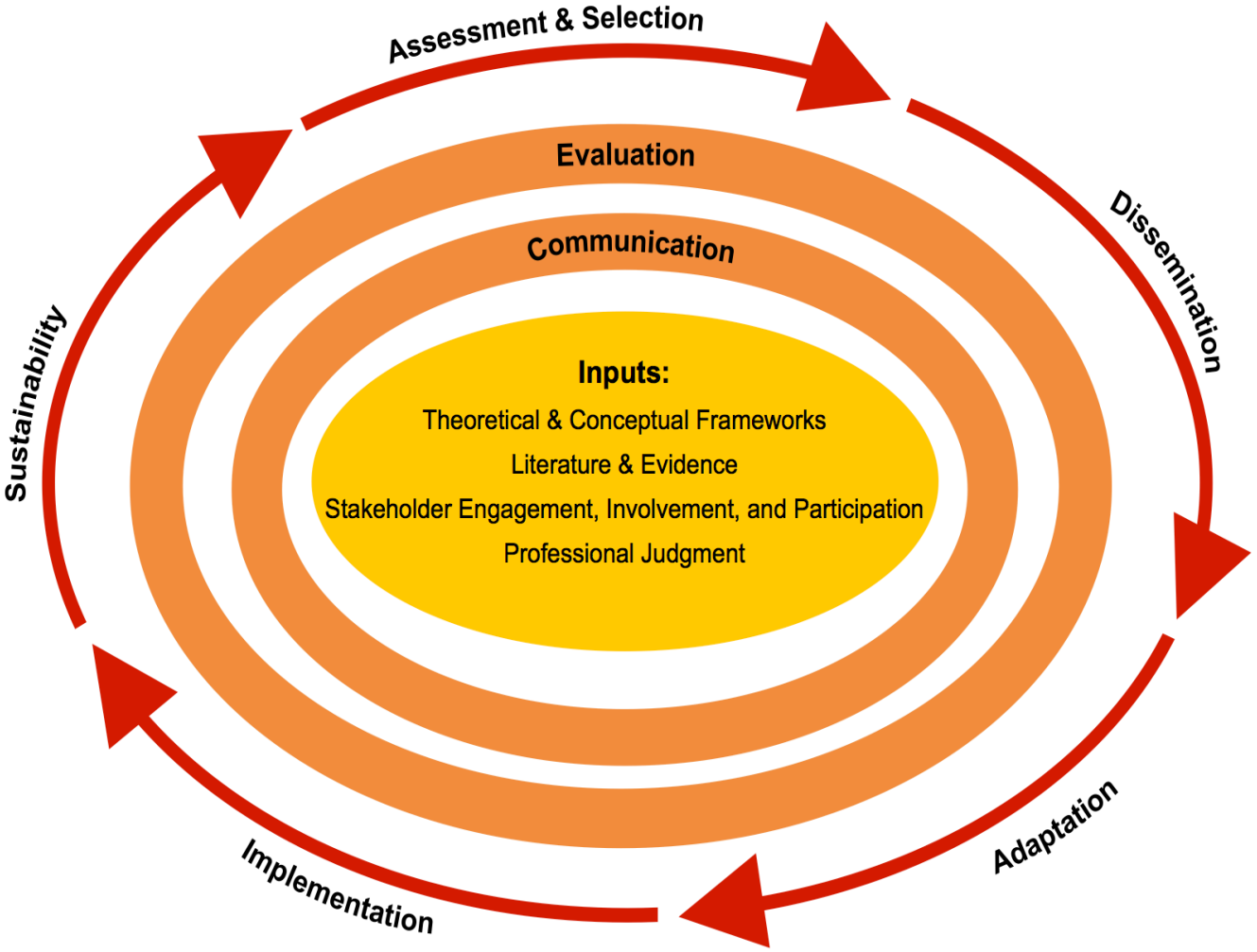
SHORT REPORT Open Access

How do researchers conceptualize and plan for the sustainability of their NIH R01 implementation projects?

Alekhya Mascarenhas Johnson[1], Julia E. Moore[1], David A. Chambers[2], Jennifer Rup[1], Camellia Dinyarian[1] and Sharon E. Straus[1,3*]

3 % focused solely on sustainability

Domains of D&I Research



Koh S, Lee M, Brotzman LE, Shelton RC (2018). An orientation for new researchers to key domains, processes, and resources in implementation science. Translational Behavioral Medicine

ANNUAL REVIEWS

Annu. Rev. Public Health 2018. 39:18.1–18.22

The *Annual Review of Public Health* is online at publhealth.annualreviews.org

https://doi.org/10.1146/annurev-publhealth-040617-014731

Copyright © 2018 Rachel C. Shelton et al. This work is licensed under a Creative Commons Attribution 4.0 International License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See credit lines of images or other third-party material in this article for license information

This article is part of a symposium on Implementation Science and Public Health. For a list of other articles in this symposium, see **http://www.annualreviews.org/toc/publhealth/39/1**

Annual Review of Public Health

The Sustainability of Evidence-Based Interventions and Practices in Public Health and Health Care

Rachel C. Shelton,[1] Brittany Rhoades Cooper,[2] and Shannon Wiltsey Stirman[3]

Why is sustainability important?

- Major challenge in sustaining programs and health benefits across settings and intervention types
  - **40% - 60%** of health programs sustain at least one component 1-6 years after adoption (Scheirer, 2005)

- Accountability for significant investments in evidence-based programs -- improved health outcomes?

- Identified as one of the "most significant translational research issues" we are facing (Proctor, 2015)

VIEWPOINT

Sustaining Health-Protective Behaviors Such as Physical Activity and Healthy Eating

Genevieve F. Dunton, PhD, MPH
Departments of Preventive Medicine and Psychology, University of Southern California, Los Angeles.

The risk of many serious chronic health conditions, including coronary heart disease, type 2 diabetes, and cancer, can be substantially reduced by protective health behaviors, such as regular physical activity and healthy dietary intake. To attain significant health benefits, however, these health-protective behaviors should be performed consistently and regularly (ie, every day or multiple times per day or week). For exam the 2008 Physical Activity Guidelines for Ameri recommend that adults should accumulate at leas minutes per week of moderate-intensity aerobic p cal activity or 75 minutes per week of vigorous-inte aerobic physical activity—preferably spread acros days of the week.[1] Furthermore, the 2015-2020 Di Guidelines for Americans recommends that a should fill half their plate with fruits and vegetabl every meal and snacking occasion.[2] For maximum h protection, physical activity and healthy dietary in should become an integral part of an individ daily routine.

A defining characteristic of these repea occurrence health behaviors, which differentiates t from limited-occurrence health behaviors suc screenings and vaccinations, is that they shoul

When the factors that influenc health-protective behaviors va short time periods and across s maintaining consistency can be

patterns of behavior are not maintained over longer follow-up intervals and typically regress to baseline levels.[5] There is limited evidence on how to help individuals avoid temporary lapses in behavior. Declines in healthy behaviors, even for short periods of time, can have negative health consequences and can increase vulnerability to permanent failure to reengage in the be-

How do you define sustainability in D&I?

Conceptualizing Sustainability

- ***Sustainability:*** the continued use of program components at sufficient intensity for the sustained achievement of desirable program goals and population health outcomes *(Scheirer & Dearing, 2011)*
- **Components of Sustainability:** *(Shelton, 2018)*
  - Continuation of program components/core elements of intervention; adaptation
  - Continuation of health benefits/health outcomes
  - Continued infrastructure/capacity (partnerships, networks, coalitions)
  - Institutionalization?

Static → Dynamic

Scheirer MA, Dearing JW. 2011. An agenda for research on the sustainability of public health programs. *Am. J. Public Health* 101:2059

Shelton, R. C., Cooper, B. R., & Stirman, S. W. (2018). The Sustainability of Evidence-Based Interventions and Practices in Public Health and Health Care. *Annual Review of Public Health, 39(1), null. doi:10.1146/annurev-publhealth-040617-014731*

Evolving Sustainability Definition

"(1) After a defined period of time, (2) the program, clinical intervention, and/or implementation strategies continue to be delivered and/or (3) individual behavior change (i.e., clinician, patient) is maintained; (4) the program and individual behavior change may evolve or adapt while (5) continuing to produce benefits for individuals/systems."

(Moore and colleagues, 2017)

Moore JE, Mascarenhas A, Bain J, Straus SE. 2017. Developing a comprehensive definition of sustainability. Implementation Science.12(1).

Methodological Challenges

- Most work has been **descriptive**, exploratory, single-site
- Rarely guided by **conceptual frameworks**
- **Variable definitions** of sustainability
- Sustainability measured **dichotomously/self-report**
- Variable time periods for follow-up; **short-term**
- Rarely **prospective**
- **Adaptations** not often captured

What do we know about sustainability?

Review of **125** studies of **sustainability**: *(Stirman et al, 2012)*

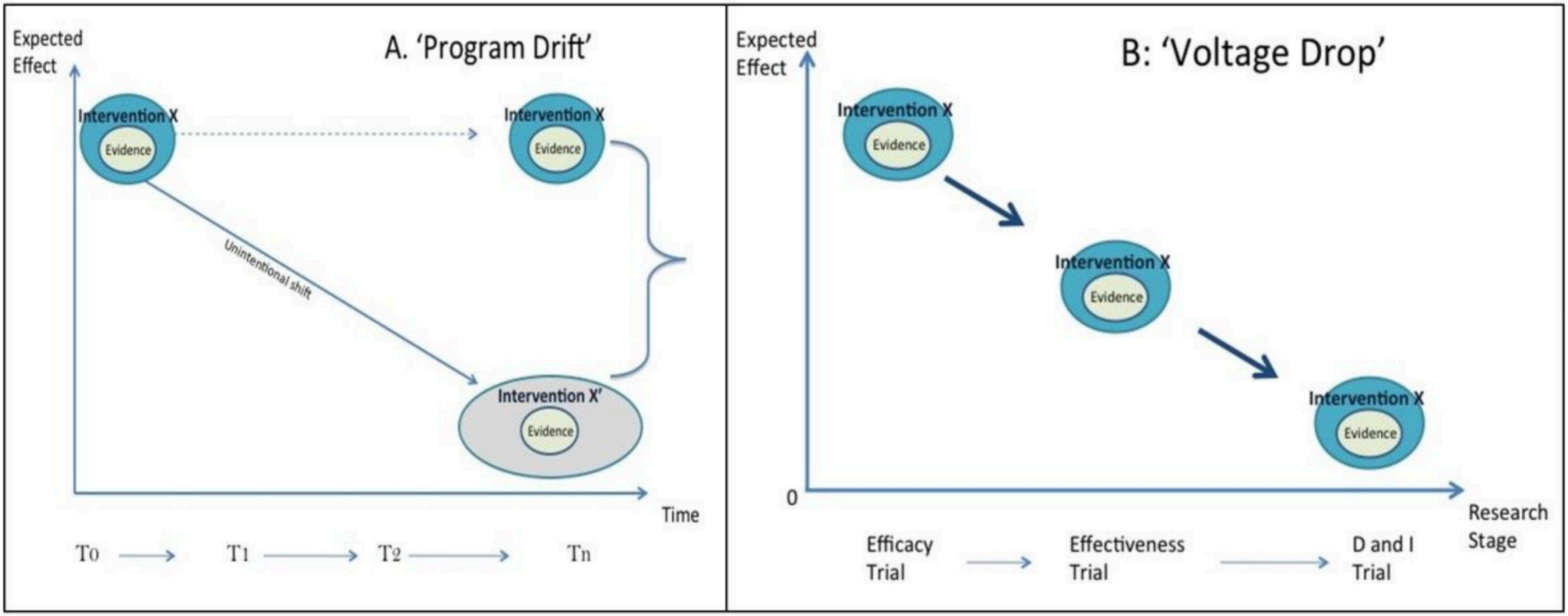
- **45%** measured continued delivery of program components
- **22%** of the studies reported health behaviors/outcomes
- **Less than half** of programs continued at high levels of fidelity

- Little information regarding **adaptations**:
  - Which components were continued or discontinued
  - Why and what adaptations were made
  - Health impact of partially sustained programs

Stirman SW, Kimberly J, Cook N, Calloway A, Castro F, Charns M. 2012. The sustainability of new programs and innovations: a review of the empirical literature and recommendations for future research. Implement. Sci. 7:17

Allen, J. D., **Shelton, R. C.,** Emmons, K. M., & Linnan, L. (2018). Fidelity and Its Relationship to Implementation Effectiveness, Adaptation, and Dissemination. In Brownson, R.C, Colditz, G.A., & Proctor, E.K (Eds.), *Dissemination and Implementation Research in Health: Translating Science to Practice* (2

Traditional views of sustainability

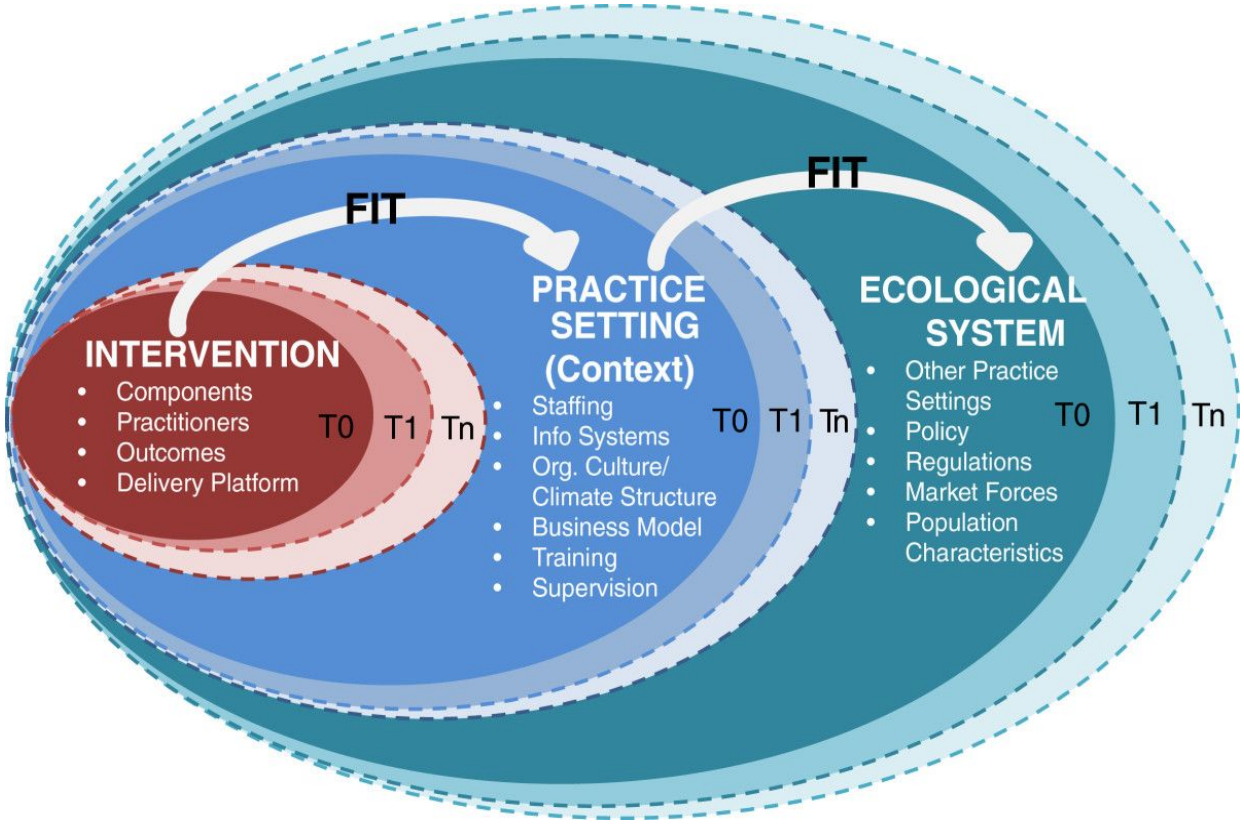


Voltage Drop: interventions expected to yield lower benefits over time as they move from efficacy to effectiveness to implementation to sustainability

Program Drift of fielded intervention over time: deviation from manualized protocols is assumed to decrease benefits

Chambers, D. A., Glasgow, R. E., & Stange, K. C. (2013). The dynamic sustainability framework: addressing the paradox of sustainment amid ongoing change. *Implementation Science*, *8*(1), 117.

Dynamic Sustainability Framework (DSF)



The Dynamic Sustainability Framework (DSF) Focuses on continued learning and evaluation, problem-solving, and ongoing adaptations of interventions to enhance their fit with different populations and within differing contexts over time, and as new evidence emerges

Chambers, D. A., Glasgow, R. E., & Stange, K. C. (2013). The dynamic sustainability framework: addressing the paradox of sustainment amid ongoing change. *Implementation Science*, *8*(1), 117.

What Influences Sustainability?

- In addition to funding, range of broad factors identified as potentially important influences: (Shelton et al., 2018)
  - **Outer context:** (policies)
  - **Inner context:** organizational factors
  - **Characteristics of intervention** and population; fit
  - Practitioner/staff/implementer **characteristics**

Scheirer MA. 2005. Is sustainability possible? A review and commentary on empirical studies of program sustainability. *Am. J. Eval.*

Shelton, R. C., Cooper, B. R., & Stirman, S. W. (2018). The Sustainability of Evidence-Based Interventions and Practices in Public Health and Health Care. *Annual Review of Public Health, 39(1), null. doi:10.1146/annurev-publhealth-040617-014731*

EPIS (Aarons et al. 2011)

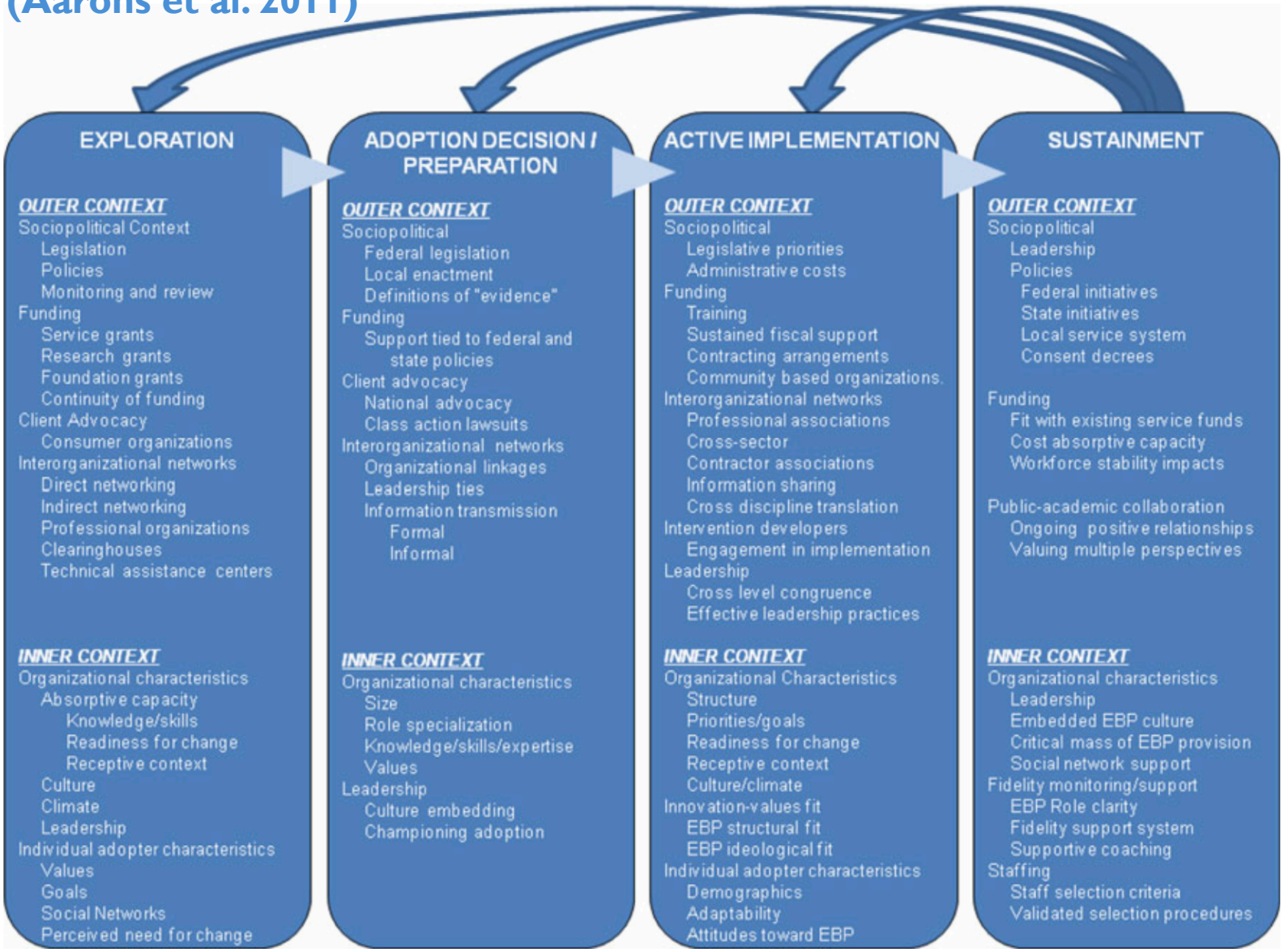
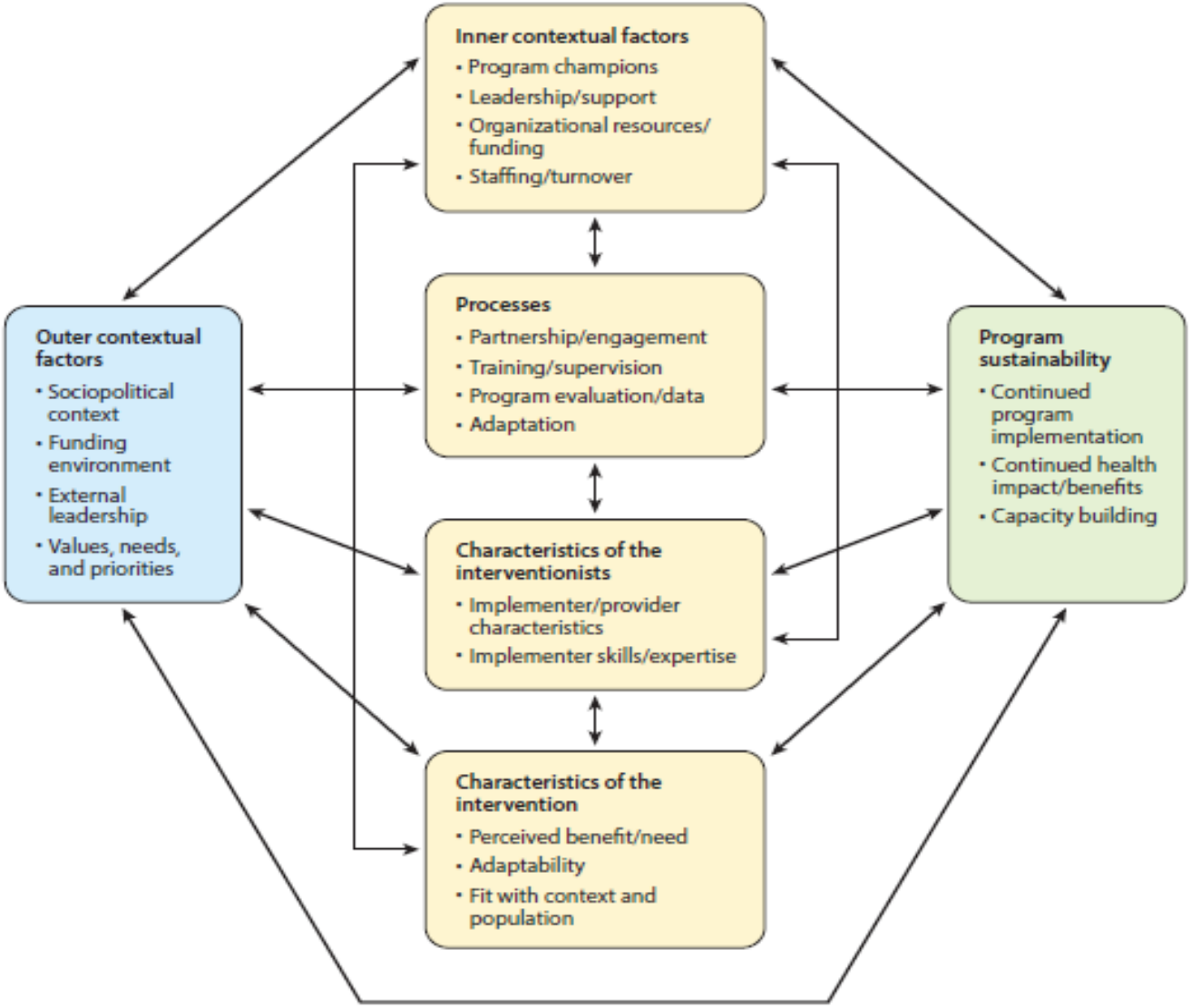


Fig. 2 Conceptual model of implementation phases and factors affecting implementation in public service sectors

Integrated Sustainability Framework



Shelton, R. C., Cooper, B. R., & Stirman, S. W. (2018). The Sustainability of Evidence-Based Interventions and Practices in Public Health and Health Care. *Annual Review of Public Health, 39(1), null. doi:10.1146/annurev-publhealth-040617-014731*

Table 1 Emerging factors associated with sustainability across multiple settings and contexts

	Community	School	Clinical/social service	Global	Whole systems	Coalitions
Outer context						
Policy and legislation	X		X			
Sociopolitical context	X		X	X	X	
Funding environment	X	X	X	X	X	X
Leadership			X		X	X
Values, priorities, needs			X	X	X	
Community ownership				X		
Inner context						
Funding/resources	X	X	X	X		
Leadership/support	X	X	X			
Climate/culture			X			
Staffing/turnover	X	X	X		X	
Structural characteristics		X			X	
Capacity	X			X		
Champion	X		X		X	
Policies (alignment)		X			X	
Mission				X		

Shelton, R. C., Cooper, B. R., & Stirman, S. W. (2018). The Sustainability of Evidence-Based Interventions and Practices in Public Health and Health Care. *Annual Review of Public Health, 39(1), null. doi:10.1146/annurev-publhealth-040617-014731*

	Community	School	Clinical/social service	Global	Whole systems	Coalitions
Intervention characteristics						
Adaptability	X		X	X	X	
Fit with population and context	X	X	X		X	
Benefits/need	X		X	X		X
Burden/complexity	X					
Trialability						X
Cost				X		
Processes						
Partnership/engagement	X		X	X		X
Training/support/supervision	X	X	X			
Fidelity		X	X			
Adaptation			X			
Planning	X					X
Team/board functioning						X
Program evaluation/data	X	X	X		X	X
Communication	X		X			
Technical assistance				X		
Capacity building	X			X		
Implementer and population characteristics						
Provider/implementer characteristics	X		X	X		
Implementation skills/expertise	X			X		X
Implementer attitudes	X					
Implementer motivation	X					
Population characteristics				X		

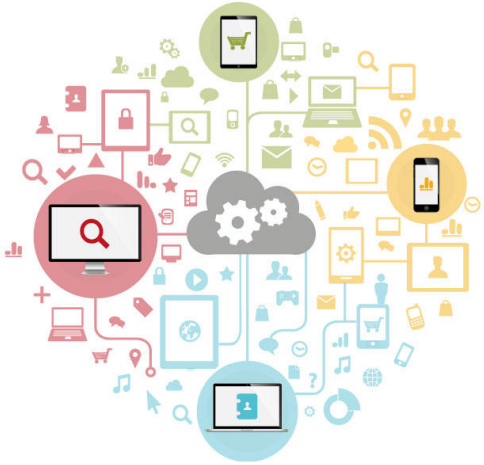
Shelton, R. C., Cooper, B. R., & Stirman, S. W. (2018). The Sustainability of Evidence-Based Interventions and Practices in Public Health and Health Care. *Annual Review of Public Health, 39(1), null. doi:10.1146/annurev-publhealth-040617-014731*

School

Clinical

Community

Coalitions



Whole system

Global

Systematic review | Open Access | Published: 06 January 2020

The sustainability of public health interventions in schools: a systematic review

Lauren Herlitz ✉, Helen MacIntyre, Tom Osborn & Chris Bonell

Implementation Science **15**, Article number: 4 (2020) | Cite this article

Results

Of the 9677 unique references identified through database searching and other search strategies, 24 studies of 18 interventions were included in the review. No interventions were sustained in their entirety; all had some components that were sustained by some schools or staff, bar one that was completely discontinued. No discernible relationship was found between evidence of effectiveness and sustainability. Key facilitators included commitment/support from senior leaders, staff observing a positive impact on students' engagement and wellbeing, and staff confidence in delivering health promotion and belief in its value. Important contextual barriers emerged: the norm of prioritising educational outcomes under time and resource constraints, insufficient funding/resources, staff turnover and a lack of ongoing training. Adaptation of the intervention to existing routines and changing contexts appeared to be part of the sustainability process.

Linking Sustainability Research to Interventions Types *(Scheirer, 2013)*

FRAMING HEALTH MATTERS

Linking Sustainability Research to Intervention Types

Mary Ann Scheirer, PhD

Researchers, funders, and managers of health programs and interventions have become concerned about their long-term sustainability. However, most research about sustainability has not considered the nature of the program to be sustained. Health-related interventions may differ in their likelihood of sustainability and in the factors likely to influence continuation. I suggest a framework for analyzing the sustainability of 6 types of interventions: (1) those implemented by individual providers; (2) programs requiring coordination among multiple staff; (3) new policies, procedures, or technologies; (4) capacity or infrastructure building; (5) community partnerships or collaborations; and (6) broad-scale system change. Hypotheses for future research and strategies that program managers might use to achieve sustainability also differ by program or intervention type. (*Am J Public Health.* 2013;103:e73–e80. doi:10.2105/AJPH.2012.300976)

Intervention Type	*Sustainability Hypotheses*
Interventions implemented by individual providers	• High rates of sustainability compared with other intervention types, if implemented appropriately before sustainability assessed • Strongly influenced by whether payment for the individual's delivery is included within normal streams of financial support (e.g. fee-for-service medicine) • Strongly influenced by the individual's motivation to continue the new practice
Interventions requiring coordination among multiple staff	• Strongly influenced by factors within the organizational context (e.g. administrative support, project champions, congruence with organization's underlying mission and culture, fit with organizational procedures and programs) • Strongly influenced by availability of continued financial resources for supporting staff and administrators involved • Enhanced by external training and technical assistance to organizational leaders for organizational processes and planning required
New policies, procedures, and technologies	• Likely to have high rates of sustainability once fully implemented • Influenced by continued efforts to monitor and enforce the intended new policy • At least some continued use is likely - after some new technologies are in place and fully implemented, it may be impossible to revert to the previous system • Inadequate implementation or lack of technical support may hamper effectiveness of new technology
Capacity or infrastructure building	• Depends strongly on continued presence of those trained during capacity building (e.g. low turnover) • Does not depend as heavily on new sources of financial support • Efforts depend strongly on the political and financial climates affecting organization • Capacity or infrastructure building that focuses on changes in technology or standard operating procedures more likely to be sustained after full implementation than capacity building that focuses on training individuals
Collaborative partnerships or coalitions	• Formal coalitions or partnerships developed during a funded initiative are more likely to be sustained than the activities delivered during the funded period, if partnership members are committed • Sustaining coalitions or partnerships beyond the initial funded period may enable them to develop new activities, win new grants, or otherwise continue to address the focus problem area • May not require new external funding sources; coalition leadership and partners' perceptions of the value of continued affiliation are more influential than additional external funding
Broad-scale system change	• Likely to require a long period of continuing and diverse efforts to achieve the desired outcomes • Likely to require continued funding for a long time (e.g. 10-20 years), rather than typical 3-5-year grant period • Environmental contexts are likely to be especially influential for sustaining changes in a broader health system

Scheirer M.A. (2013). Linking sustainability research to intervention types. *American journal of public health*, *103*(4), e73-80.

How can we plan for sustainability?

Capacity for Sustainability

- **Sustainability capacity:** presence of structures and processes that allow a program to maximize resources to successfully implement and maintain evidence-based policies and activities

- Measured using the 40-item **Program Sustainability Assessment Tool (PSAT)**
  - **sustaintool.org**

Schell, S. F., Luke, D. A., Schooley, M. W., Elliott, M. B., Herbers, S. H., Mueller, N. B., & Bunger, A. C. (2013). Public health program capacity for sustainability: a new framework. *Implementation Science*, *8*(1), 1.

Luke, D. A., Calhoun, A., Robichaux, C. B., Elliott, M. B., & Moreland-Russell, S. (2014). The Program Sustainability Assessment Tool: a new instrument for public health programs. *Preventing chronic disease*, *11*, 130184. doi:10.5888/pcd11.130184

Program Sustainability Framework and Domain Descriptions V2

ENVIRONMENTAL SUPPORT
Having a supportive internal and external climate for your program

FUNDING STABILITY
Establishing a consistent financial base for your program

PARTNERSHIPS
Cultivating connections between your program and its stakeholders

ORGANIZATIONAL CAPACITY
Having the internal support and resources needed to effectively manage your program

PROGRAM EVALUATION
Assessing your program to inform planning and document results

PROGRAM ADAPTATION
Taking actions that adapt your program to ensure its ongoing effectiveness

COMMUNICATIONS
Strategic communication with stakeholders and the public about your program

STRATEGIC PLANNING
Using processes that guide your program's direction, goals, and strategies

Center for Public Health Systems Science
GEORGE WARREN BROWN SCHOOL OF SOCIAL WORK

Copyright 2013. The Program Sustainability Framework V2 is a copyrighted instrument of Washington University, St Louis, MO. All rights reserved.
If you would like more information about the framework or our Program Sustainability Assessment Tool, visit: https://sustaintool.org Aug 2013.

Measured using adapted 40-item **Program Sustainability Assessment Tool (PSAT)**

•sustaintool.org (Doug Luke, Washington Univ; Luke et al., 2014)

Luke, D. A., Calhoun, A., Robichaux, C. B., Elliott, M. B., & Moreland-Russell, S. (2014). The Program Sustainability Assessment Tool: a new instrument for public health programs. *Preventing chronic disease, 11*, 130184. doi:10.5888/pcd11.130184

Calhoun, A., Mainor, A., Moreland-Russell, S., Maier, R. C., Brossart, L., & Luke, D. A. (2014). Using the Program Sustainability Assessment Tool to assess and plan for sustainability. *Preventing chronic disease, 11*, 130185. doi:10.5888/pcd11.130185

Other Tools: Planning for Sustainability

- CSAT (Clinical version)
- NHS Sustainability Model and Guide

- Community-based Participatory Research
- Program Planning Models
  - Precede/Proceed Model (Lawrence Green)
  - Intervention Mapping (Kok, Fernandez)

Examples: Sustainability in Cancer Prevention Interventions

TBM

ORIGINAL RESEARCH

Sustained use of an occupational sun safety program in a recreation industry: follow-up to a randomized trial on dissemination strategies

David B. Buller, PhD,[1] Barbara J. Walkosz, PhD,[1] Peter A. Andersen, PhD,[2] Michael D. Scott, PhD,[3] Gary R. Cutter, PhD[4]

Buller et al., 2015 assessed sustainability of **Go Sun Smart** 5-7 years after program dissemination

Sustainability of Go Sun Smart

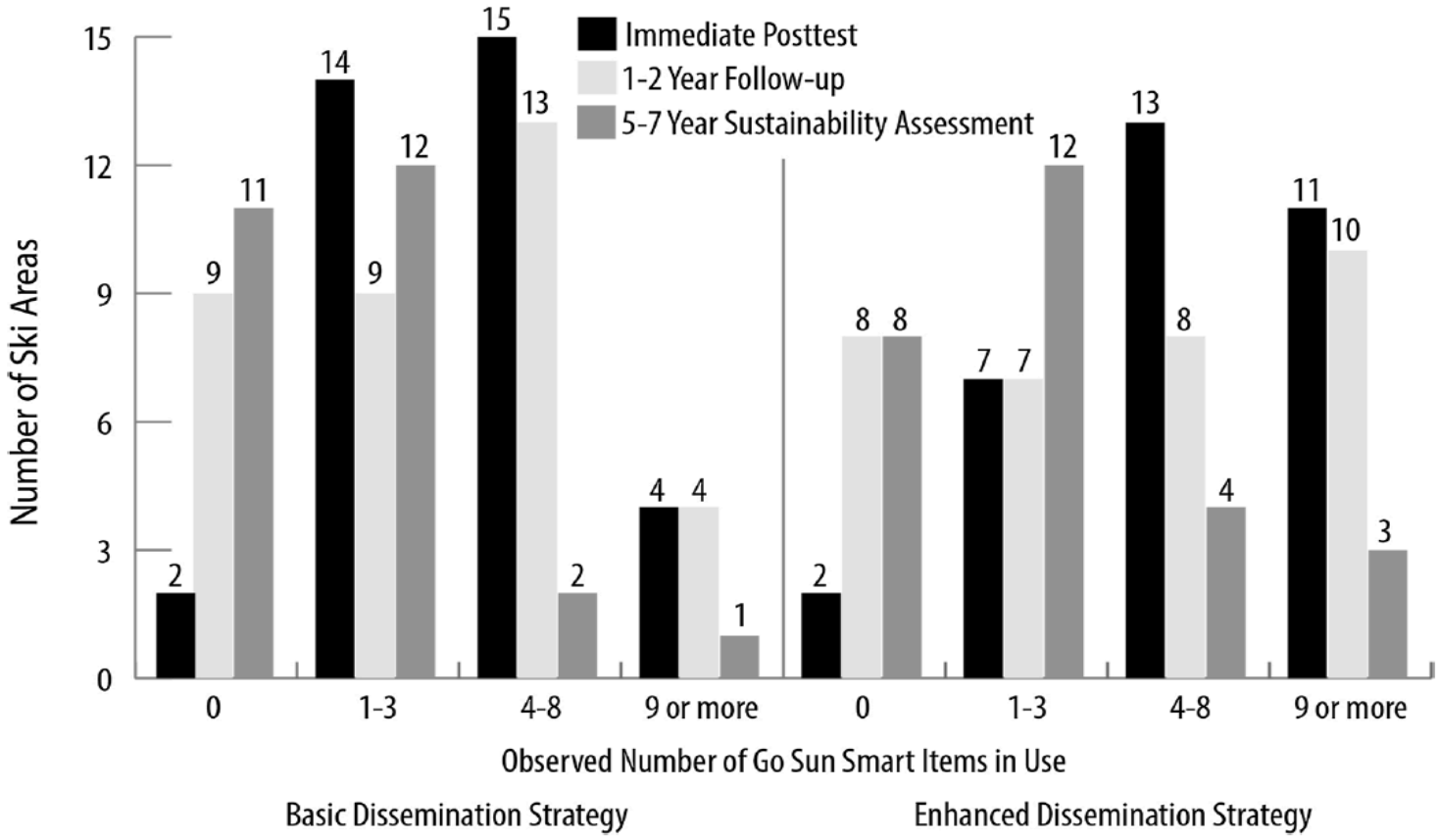


Fig 2 | Observed number of Go Sun Smart items in use by Basic and Enhanced Dissemination Strategy at Immediate Posttest (0_1), 1- to 2-year follow-up (0_2), and 5- to 7-year sustainability assessment (0_3)

Buller, D. B., Walkosz, B. J., Andersen, P. A., Scott, M. D., & Cutter, G. R. (2015). Sustained use of an occupational sun safety program in a recreation industry: follow-up to a randomized trial on dissemination strategies. *Translational behavioral medicine*, *5*(4), 361-371.

Sustainability of Go Sun Smart

- **Go Sun Smart** demonstrated modest sustainability 5-7 years after its distribution
  - Intervention communication had declined
  - Managers held weaker attitudes about intervention
- **Manager turnover** was key factor in discontinuance
- Level of **organizational stability** is necessary to increase the odds of program sustainability

Buller, D. B., Walkosz, B. J., Andersen, P. A., Scott, M. D., & Cutter, G. R. (2015). Sustained use of an occupational sun safety program in a recreation industry: follow-up to a randomized trial on dissemination strategies. *Translational behavioral medicine*, *5*(4), 361-371.

Lay Health Advisors (LHAs)

LHAs - trained peers, share similar social, economic, cultural, linguistic characteristics with population

- Highly effective EBI in promoting behavior change
  - Asthma and diabetes management
  - Breast and cervical cancer screening
  - Maternal/child health; HIV prevention
- Promising approach for addressing health disparities
  - Medical mistrust, stigma, discrimination
  - Structural barriers
- Disseminated and implemented globally and domestically
  - High LHA turnover: Global attrition rates up to **77%**

Example: The National Witness Project (NWP)

The National Witness Project

- **Evidence-based Lay Health Advisor (LHA) program** to address cancer disparities among African American women

- LHAs deliver group 'sessions' in community settings:
  - Trusted information, resources, education
  - Empowerment messages and social support
  - Systems Navigation, referrals
  - Testimonials and narratives about survivorship experience

- **Effective** in increasing breast/cervical cancer screening/ diagnostic follow up; NCI's Evidence-Based Cancer Control Programs

- Over past 25 years, NWP disseminated and replicated in 40 sites, across 22 states; 500+ volunteers **reaches 15,000 women/year**

Research Questions: NCI R03 (CBPR-driven)

1) What are the characteristics and capacity of LHAs (the interventionists) in African American communities?

2) What multi-level factors influence the activity levels and retention of LHAs in these programs?

3) What multi-level factors influence the sustainability of LHA Programs in under-resourced community settings?

Data Collection

- Parallel Mixed Methods Design:
  - **Concurrent, convergent**
  - **Surveys and qualitative in-depth interviews**
- Baseline Data Collection and Follow-up **~18** m later
- Follow-up Data Collection
  - Program director reports and records (~24 m later)
    - **Retention** (LHA lead any sessions in past year?)
    - **Activity levels** How many sessions did the LHA complete in the past year?)
    - Response rate and retention rate over **90%**

Research Question (1): What are the characteristics and capacity of LHAs in community settings?

HEALTH EDUCATION & BEHAVIOR

Original Article

Health Education & Behavior
2017, Vol. 44(1) 153–164
© 2016 Society for Public Health Education
Reprints and permissions:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/1090198116646365
journals.sagepub.com/home/heb
SAGE

Advancing Understanding of the Characteristics and Capacity of African American Women Who Serve as Lay Health Advisors in Community-Based Settings

Rachel C. Shelton, ScD, MPH[1], Sheba King Dunston, EdD, MPH, CHES[1], Nicole Leoce, MS[1], Lina Jandorf, MA[2], Hayley S. Thompson, PhD[3], and Deborah O. Erwin, PhD[4]

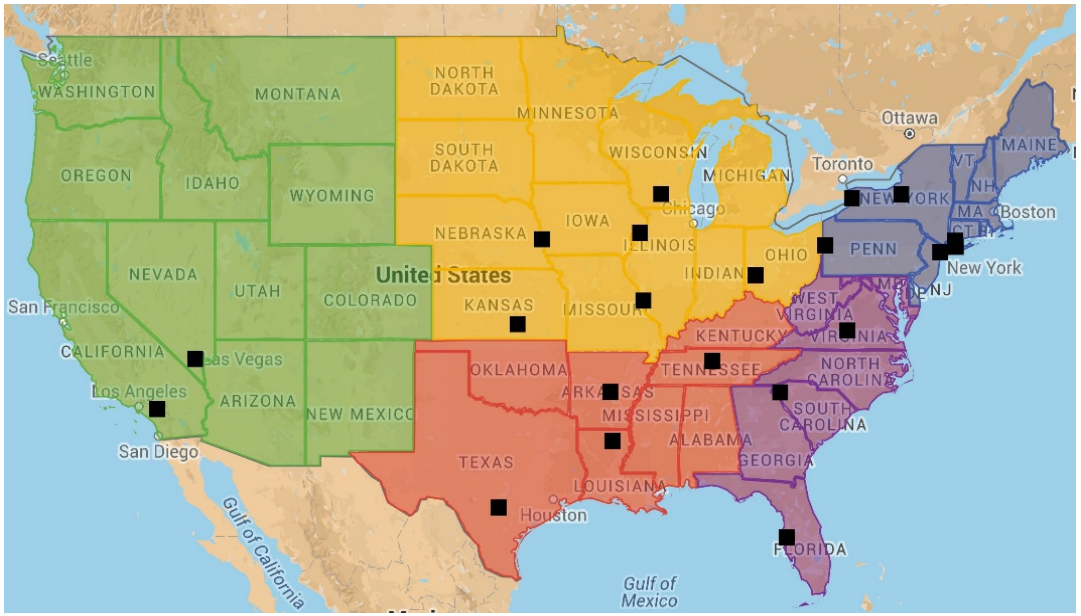
Sample Characteristics

76 participating LHAs:

- Mean length of program involvement was about 5 ½ years
- Range: 0 months to 16 years involved
- Mean age: 55 (20-80 years old)

Sites (n=8):

- Harlem, NY;
- Syracuse, NY;
- Buffalo, NY;
- Long Island, NY;
- Chicago, IL;
- Little Rock, AR;
- Tampa, FL;
- Wichita, KS



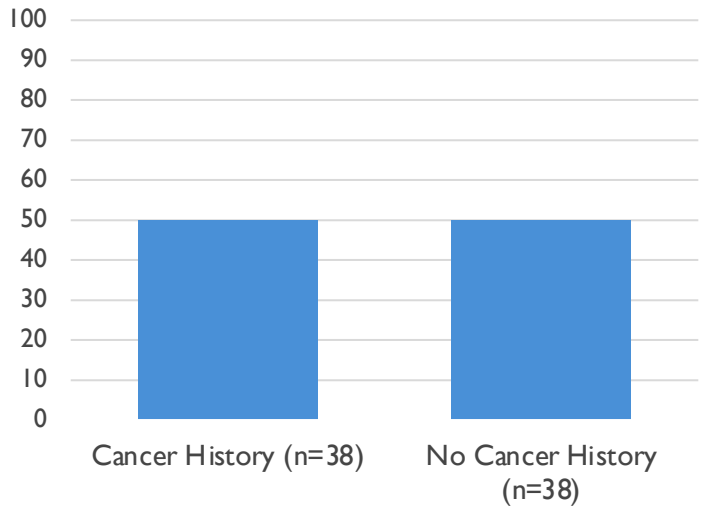
Site Characteristics

Year started

- **45%** of sites are free-standing in the community
- **27%** of sites are affiliated with/receive resources and support from another community organization (e.g., Komen, church, etc.)
- **27%** of sites are based in an partially or fully supported by an academic or medical organization (e.g., medical school, school of public health, hospital, etc.)

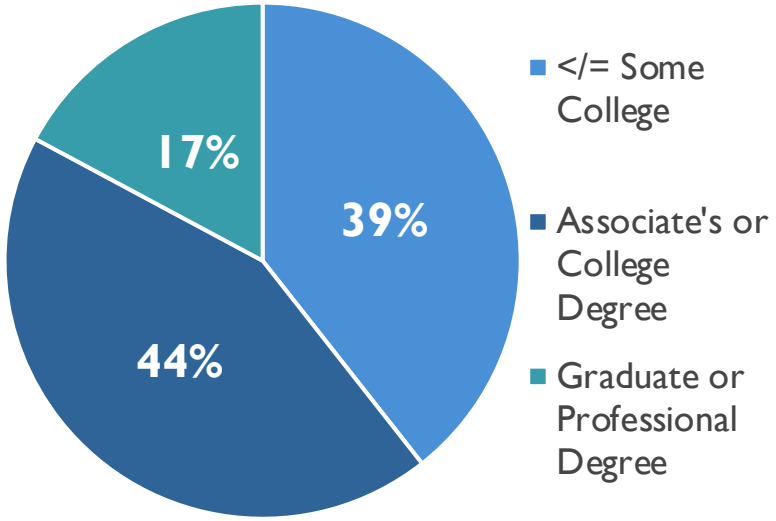
LHA/Interventionist Characteristics

Cancer Survivors



50% of LHAs were breast or cervical cancer survivors themselves.

LHA Education Level

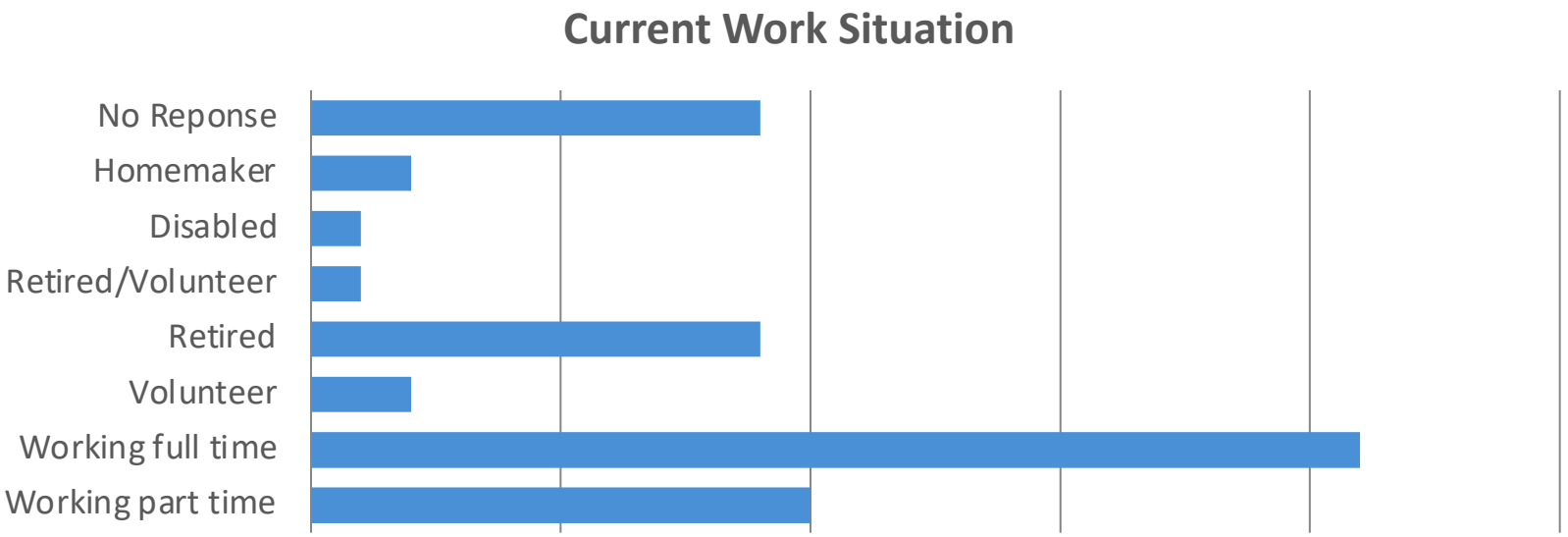


More than 40% had an associate's or college degree

Employment

- **46%** of RMs and LHAs work full time outside of their involvement with NWP

- **25%** report their current work situation is retired or volunteering



LHA/Interventionist Capacity

LHA Capacity	Indicators	Findings
Capacity at the individual level	Psychological health (autonomy, life engagement, self esteem)	• Participants scored high on psychological well-being, life purpose, and engagement
Capacity at the social level	Social networks, social network size, social support, self efficacy for diffusing info to community	• Expansive social networks (family, friends, social groups) • High levels of social support • Most women belonged to a religious group **(89%)**, volunteered outside of NWP **(76%)**, and were active members of social groups **(77%)**
Capacity at the organizational level	Breast cancer knowledge, Role self efficacy, Role commitment, Leadership competence	• High breast cancer knowledge overall • High role self efficacy • High job satisfaction and high leadership competence • Benefits*/challenges: Burnout reported

Initial and Ongoing Motivations of LHAs

- Desire to "give back" and contribute to their community and address health inequities
- Personal experiences with cancer (their own or experiences with family/friends)
- Development of new social networks and emotional support from other LHAs and leaders
- Sense of empowerment experienced through program; new transferable skills

LHA Role Benefits and Stressors

Role benefits:

- Feeling "energized"
- Feeling good about "giving" help because they had received help
- Gained valuable cancer information/skills

Role stressors:

- Worrying more about one's own health
- Having less energy for themselves/own family
- Feeling emotionally drained

* LHAs who were cancer survivors experienced strongest benefits*

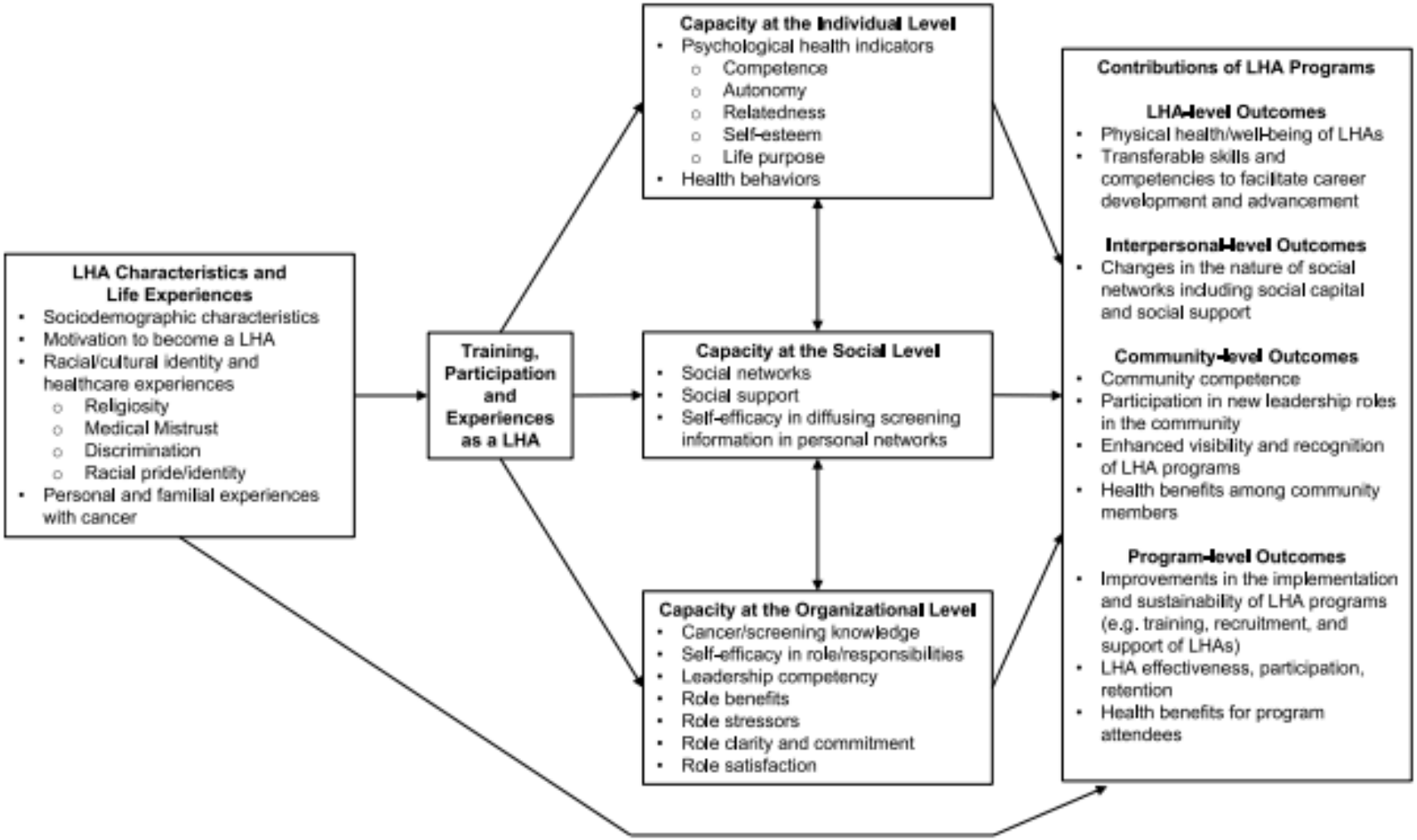


Figure 1. The Framework for Assessing Lay Health Advisor (LHA) Capacity and Contributions: A conceptual framework for understanding LHA capacity and contributions at the individual, social, and organizational levels.

Shelton, R. C., Dunston, S. K., Leoce, N., Jandorf, L., Thompson, H. S., & Erwin, D. O. (2017). Advancing understanding of the characteristics and capacity of African American Lay Health Advisors in community-based settings. *Health Education & Behavior : The Official Publication of the Society for Public Health Education*, *44*(1), 153–164. http://doi.org/10.1177/1090198116646365

Research Question:

What are the individual, social, and organizational factors that predict activity level and retention African American LHAs?

Shelton *et al. Implementation Science* (2016) 11:41
DOI 10.1186/s13012-016-0403-9

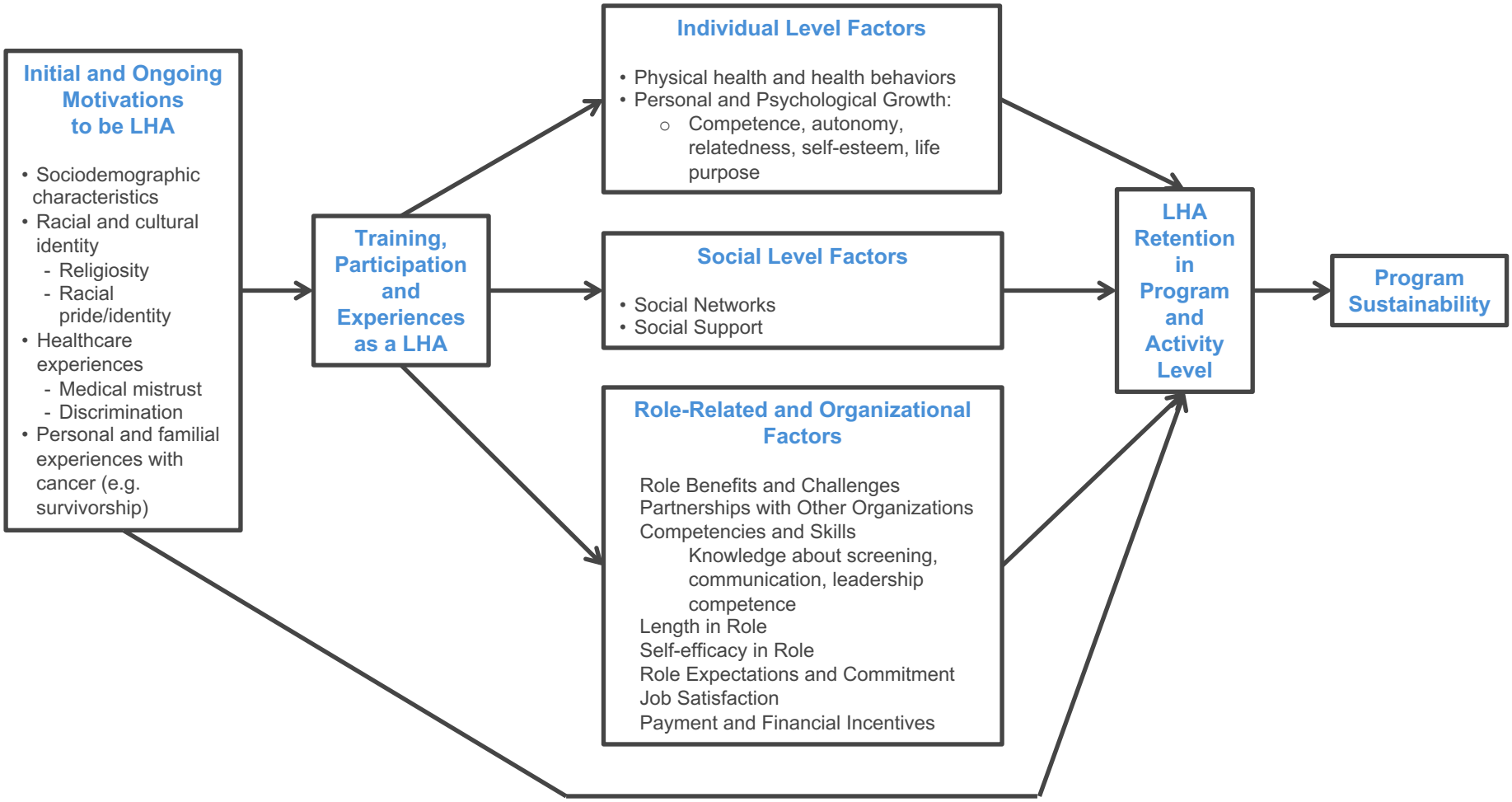
Implementation Science

RESEARCH Open Access

Predictors of activity level and retention among African American lay health advisors (LHAs) from The National Witness Project: Implications for the implementation and sustainability of community-based LHA programs from a longitudinal study

Rachel C. Shelton[1*], Sheba King Dunston[1,2], Nicole Leoce[3], Lina Jandorf[4], Hayley S. Thompson[5], Danielle M. Crookes[6] and Deborah O. Erwin[7]

Examining Factors that Predict LHA Retention and Activity



Retention and Activity Level

- Followed **76** LHAs over 18-24 months
- LHA retention in NWP was **68%** at ~18 month follow-up (1/3 completely inactive)
- Mean number of sessions conducted in the past year per LHA was **3.8**; Median = 2
- High variability in # of educational sessions annually:
  - **0 to 35**

Notable Findings & Implications

***Organizational and role-related factors most impactful**

Partnership with academic institution/cancer center predicted LHA/RM involvement and activity level

- LHAs from non-academic sites had a **80%** decrease in odds of being active/retained than LHAs from academic sites

- Sites with these academic partnerships more likely to:
    - Hold regular trainings
    - Provide stipend
    - Have a steering committee
    - Have physical space for the program

Potential Strategies: Form partnerships; identify program champions

Notable Findings & Implications

- **Longer time in program associated with lower chance of remaining involved**
  - LHAs/RMs may need support to prevent dropout/burnout
  - Incentives, community recognition
- **Having clear role expectations associated with continued involvement**
  - Clarifying role expectations at initial and ongoing trainings
- **Role self-efficacy (knowledge/skills) associated with higher activity levels**
  - Strategies to increase self-efficacy through training/feedback

Research Question:

What factors influence the sustainability of LHA Programs in under-resourced community settings?

TBM

ORIGINAL RESEARCH

CrossMark

Advancing understanding of the sustainability of lay health advisor (LHA) programs for African-American women in community settings

Rachel C. Shelton, ScD, MPH,[1] Thana-Ashley Charles, MPH,[1] Sheba King Dunston, EdD, MPH,[1,2] Lina Jandorf, MA,[3] Deborah O. Erwin, PhD[4]

Qualitative Research Helps us…

- Understand context, complexity
- Explore new phenomena from multiple perspectives
- Generate, refine, and extend theory (how/why)
- Illuminate new research questions
- Elicits stakeholder-centered perspectives
- Unpack quantitative findings

NIH NATIONAL CANCER INSTITUTE
Division of Cancer Control & Population Sciences

QUALITATIVE METHODS IN IMPLEMENTATION SCIENCE

Kegler, M. C., Raskind, I. G., Comeau, D. L., Griffith, D. M., F., H. L., & Shelton, R. C. (2019). Study Design and Use of Inquiry Frameworks in Qualitative Research Published in Health Education & Behavior. *Health Education & Behavior*, *46*(1), 24–31.

HEALTH EDUCATION & BEHAVIOR

Commentary: Advancing the Science of Qualitative Research to Promote Health Equity

The Promise of Qualitative Research to Inform Theory to Address Health Equity

Rachel C. Shelton, ScD, MPH[1], Derek M. Griffith, PhD[2], and Michelle C. Kegler, DrPH, MPH[3]

Health Education & Behavior
2017, Vol. 44(5) 815–819
© 2017 Society for Public Health Education
Reprints and permissions:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/1090198117728548
journals.sagepub.com/home/heb
SAGE

HEALTH EDUCATION & BEHAVIOR

Editorial

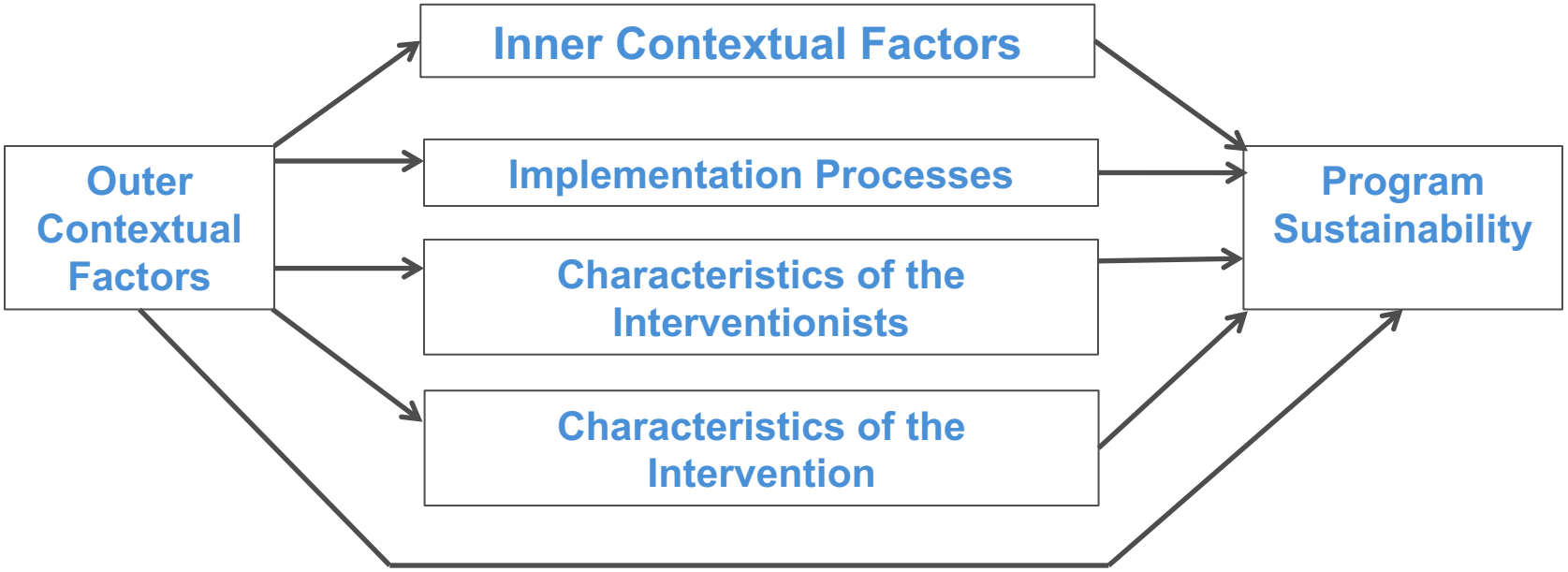
Advancing the Science of Qualitative Research to Promote Health Equity

Derek M. Griffith, PhD[1], Rachel C. Shelton, ScD, MPH[2], and Michelle C. Kegler, DrPH, MPH[3]

Health Education & Behavior
2017, Vol. 44(5) 673–676
© 2017 Society for Public Health Education
Reprints and permissions:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/1090198117728549
journals.sagepub.com/home/heb
SAGE

Shelton, R. C., Griffith, D. M., & Kegler, M. C. (2017). The Promise of Qualitative Research to Inform Theory to Address Health Equity. *Health Education & Behavior*, *44*(5), 815–819.

Levels of Influence on Sustainability



Outer Contextual/Policy Factors

1) Partnerships with Community-based and Academic Organizations/Cancer Centers:

- Facilitate access to services (e.g. low cost of free mammography screening; referrals to provider networks, diagnostic FU; support groups)
- Access to resources/materials (e.g. information, space for programs or administration)

2) External funding availability

- National, state and local funding: disvaluing

"You are constantly in a state of trying to reach a maximum number of people with the limited amount of resources and money."

"We're fortunate in that we have a partnership with a cancer research hospital where there may be some of those resources that are available that we would have influence with."

Inner Contextual Factors

1) Program Champions and Supportive leadership

NWP Director at local level:

- Contact and connections in community
- Vision and emotional support to staff

"… that's what helps us to be successful- that person who is networking and doing the leg work to get these events scheduled and these opportunities for us…it's a vital part of our success. …You can't run a tight ship if you don't have a good captain and she is an excellent captain, she's very hard working, she stays on the go but she takes care of her people"

2) Organizational Infrastructure (e.g. space, community board, paid positions)

"I think they need to do more at the national level in getting direction and information to the local levels and help their partnerships out in the field. We are their arms and legs, but they are the umbrella that has to make it work"

Implementation Processes

Training

- Knowledge
- Role-playing practice
- Self-efficacy

The 'train the trainer model' that NWP uses was perceived by some participants as "a really good aspect of the self-sustainability of the program" that allowed NWP to develop a "volunteer power house."

Characteristics of LHAs

1) Passion and Commitment of LHAs
2) Personal Motivations:
   - Social networks/social support
   - Sense of empowerment/giving back
   - Benefits received (skills, knowledge, professional/career development)
   - Healing for survivors/life after cancer
3) Paid/volunteer; burnout

"I have become a better person from it and I plan to be a Lay Health Advisor for a very long time."

"It's one thing, on paper to just provide outreach screening and insurance support for people. The emotional side of what happens to someone who has to deal with having cancer, recovering from it, it is just huge... So having a group, a support group, a place where you can go and talk and share, and even just sometimes to vent about how hard it is or how happy you are to be a survivor is I think critically important in terms of emotionally surviving."

Characteristics of the Intervention

1) Perceived benefit/need

- For African American community, by African American community

2) Fit with organization mission

- Addresses social/health inequities

"I think the dedication of the ladies…we as African American women in the past have not had a lot of programs and activities that are designed for us…the emphasis and the start of this program was designed for African American women and I think that makes a big difference. I feel that we are more trusting of our own people when they bring us the information "

"I like the sense of sisterhood, I like that especially that is women of color because like I said in our community often we do not take [care] of ourselves or we take care of ourselves last and that we are just helping one another to become more and better informed about our health."

Overall Findings: Sustainability

60% of sites in past 5 years inactive; 30% LHAs inactive

Barriers:

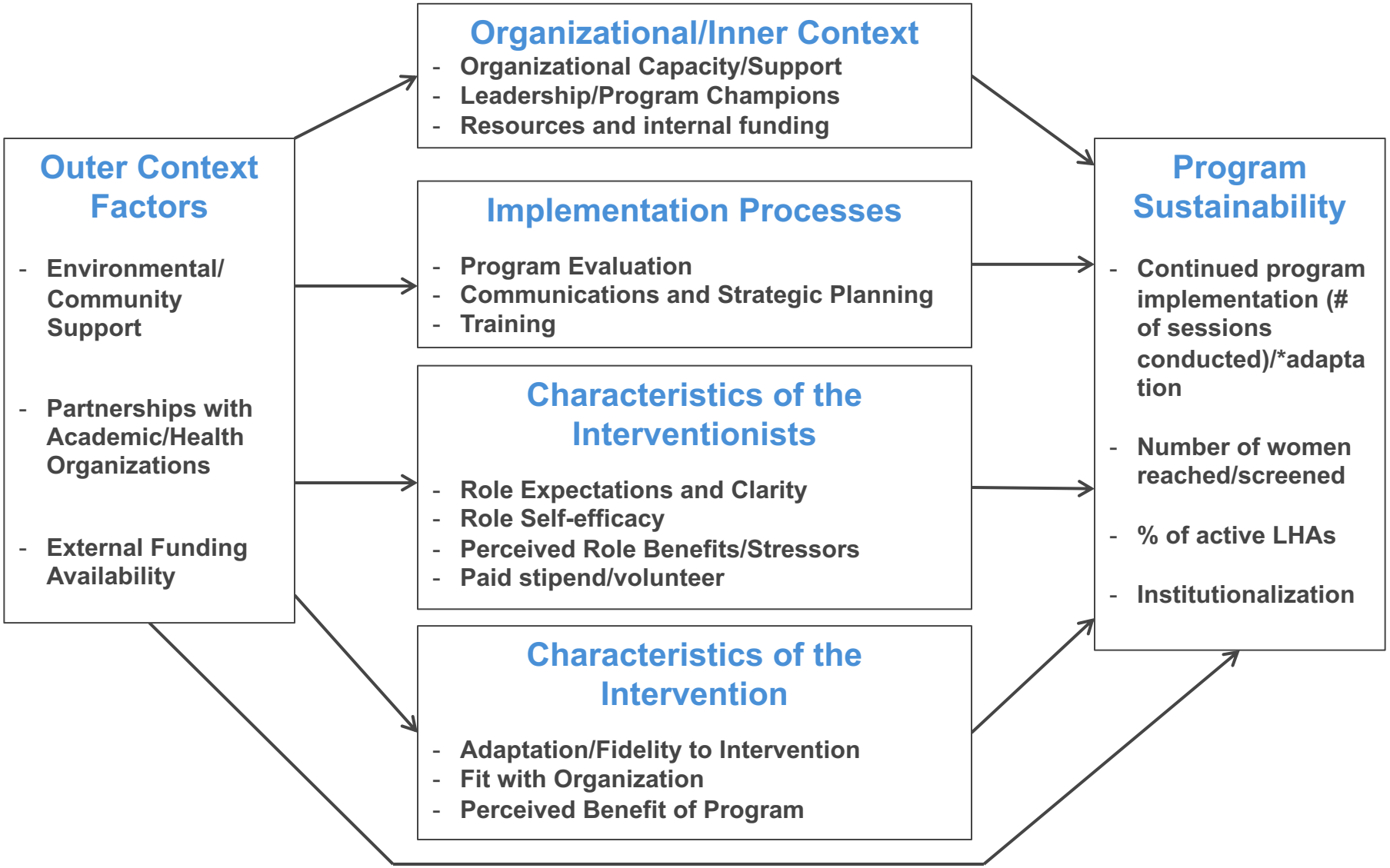
- Funding
- Organizational Infrastructure limited
- National leadership
- Limited training/evaluation/communications in place
- LHA burnout

Facilitators:

- Organizational partnerships
- Project Director leadership/commitment; champions
- Commitment of LHAs (personal, social, professional benefits)
- Fit with African American community
- Powerful role of Cancer survivors

Mixed-methods data informed development of conceptual framework

LHA Sustainability Framework



Next Steps: RSG from American Cancer Society

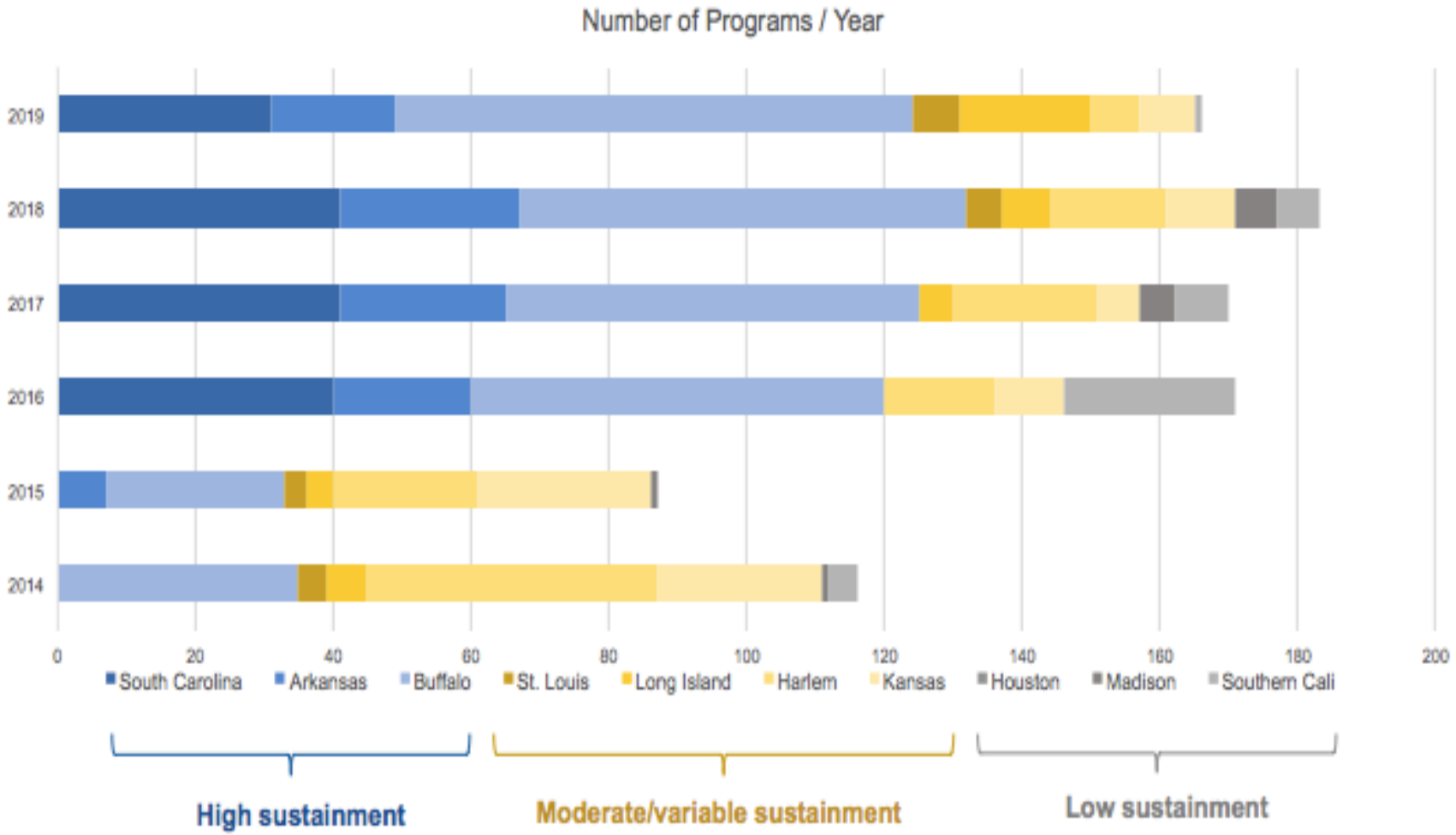
Mixed-methods prospective national study examining predictors of sustainability over 4 years:

- 250 LHAs/leaders
- 14-16 sites

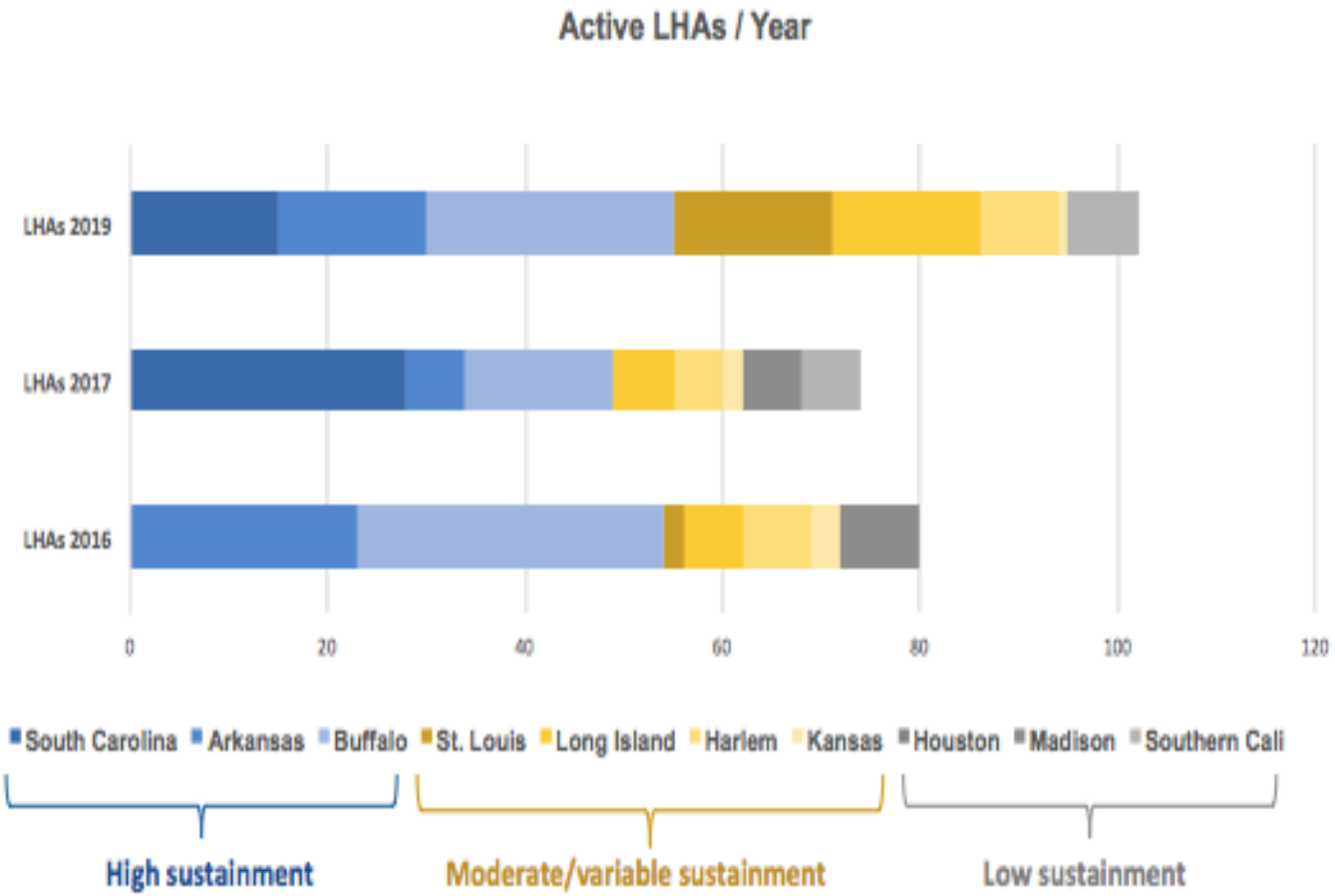
Specific Aims:

1. What factors and strategies that promote or impede NWP program sustainability? (qualitative; case study)
2. Which factors predict the sustainability and impact of the NWP program nationally? (prospective survey annually)
3. How has NWP adapted to meet new cancer screening guidelines and identify barriers and facilitators to de-implementation (e.g. adaptation of program to reflect updated breast/cervical cancer screening guidelines)?

Sustainability Outcome (1): Continued Delivery of Program Over Time



Sustainability Outcome (2): Continued Infrastructure- Program Delivery



Sites	Total 2019 'womanpower'
South Carolina	43
Arkansas	26
Buffalo	50
St. Louis	26
Long Island	20
Harlem	19
Kansas	1
Houston	0
Madison	1
Southern Cali	18

Sustainability Outcome (3): Institutionalization

		Written Goals & Objective	Super-visor Assigned	Formal Job Descrip tions	Perm-anent Staff	Admin Person Advocate	Other Staff	Stable Funding
High	South Carolina	No	No	Yes	No	Yes	No	No
	Arkansas	Yes	Yes	Yes	Yes	Yes	Yes	No
	Buffalo	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Moderate	St. Louis	Yes	No	Yes	No	Yes	Yes	No
	Long Island	No	Yes	No	Yes	Yes	No	No
	Harlem	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Kansas	Yes	No	Yes	No	No	No	No
Low	Houston	Yes	No	No	Yes	Yes	Yes	Yes
	Madison	Yes	No	No	No	No	No	Yes
	Southern Cali	No	No	Yes	No	Yes	No	No

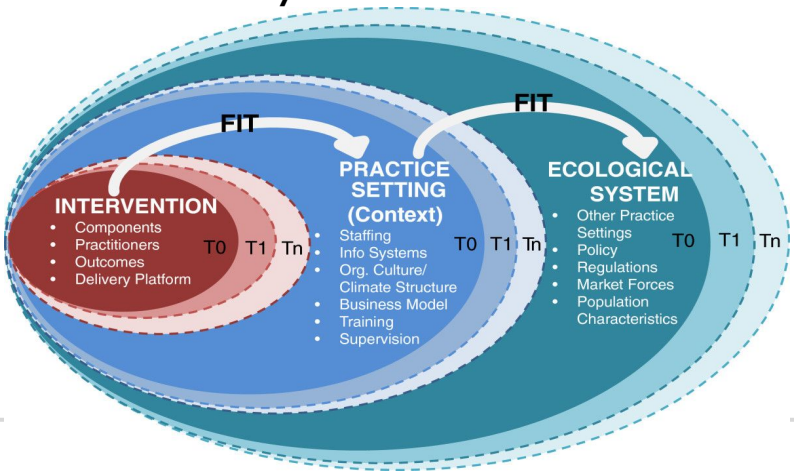
Dynamic Context

Outer Context*

- **Academic Partnerships:** Moderate/High gained resources/funding from partners
- **Community Partnerships:** Moderate/High engaged in resource exchange w/ community partners (e.g. access to screening, space)
- **National support/leadership:** High had positive relationships w/national leadership
- **Funding availability:** Short-term/lack of diversity of funds key challenges across; relationships w/funders negative at low sites

Inner Context*

- Funding/Budgets: Moderate/High had more local/state grants; non-sustained had abrupt budget cuts from academic medical centers
- Organizational Stability/Fit: Most sites moved out of academic centers and were free-standing in community



Project Director Sustainability Challenges

- Funding Challenges (100%)
- Staff retention, turnover, and recruitment of LHAs/RMs (50%)
- Lack of organizational resources or infrastructure (50%)
- Lack of Program Evaluation (30%)
- Political/partnership issues mentioned (30%)

Emerging Issue: De-implementation

"The systematic, structured elimination of low-value practices that no longer are (or never were) supported by the best available evidence, because they are unnecessary, costly, or do not improve outcomes"

COMMENTARY

Unpacking the complexities of de-implementing inappropriate health interventions

Wynne E. Norton* and David A. Chambers

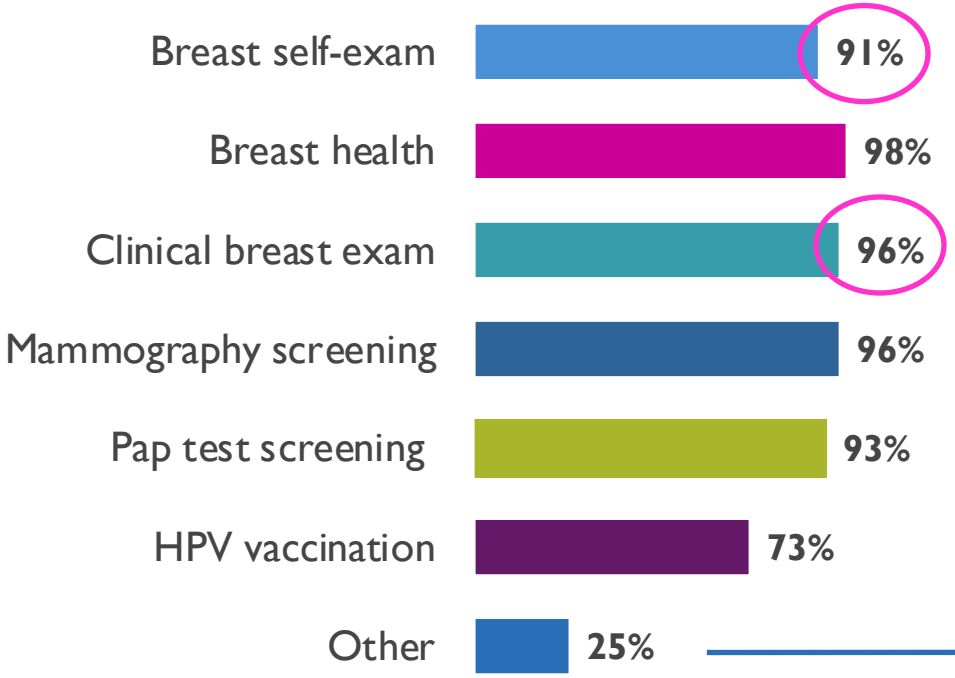
Bonafide, C. P., & Keren, R. (2018). Negative Studies and the Science of Deimplementation. JAMA Pediatrics, 172(9), 807-809.

National Guidelines for Screening

	American Cancer Society 2015	US Preventive Task Force 2016	American Medical Association	National Comprehensive Cancer Network
Age to Start Mammograms	**45** (Individual choice **40-44**)	**50**	Eligible at **40**; Annual at age **50**	**50** (40-49 Individual choice)
Age to Stop Mammograms	When life expectancy **<10 years**	**74**	When life expectancy **<10 years**	Upper age limit not established - 40-49 Grade "C" Individual decision; 50-74 Grade "B" biennial screening; 75+ Grade "I" Insufficient Evidence
Interval	Annual 45-54; 1-2 years 55+	2 years	Annual	Biennial
Breast Self Exam	No statement	Do not teach BSE		
Clinical Breast Exam	Not recommended	No statement		

Results: Lay Health Advisors
Services provided

The majority of LHAs reported providing education on breast self-exams (BSE) and clinical breast exams despite changing evidence and recommendations



Other topics covered:

- Environmental risks
- Genetic counseling/testing
- HPV vaccination education
- Chronic disease prevention
- Colon cancer screenings
- Family tree seminars

Results: Lay Health Advisors
Mammography recommendations

Most LHAs report recommending annual mammography screening starting at age 40

80%

Report their site recommends initiating mammography screening at **age 40**

91%

Report their site recommends **annual** mammography screening

	American Cancer Society 2015	US Preventive Task Force 2016
Age to Start Mammograms	45	50
Age to Stop Mammograms	When life expectancy <10 years	74
Interval	Annual 45-54; 1-2 years 55+	2 years
Breast Self Exam	No statement	No statement
Clinical Breast Exam	Not recommended	No statement

Screening Guidelines Used (n=201 LHAs/RMs/PDs)

40% American Cancer Society

41% National Witness Project (local or national)

2% US Preventive Services Task Force Screening Guidelines

17% Not sure/Other

De-adoption Measures (Massatti, 2008)

Measure domains:

- Decision and planning influences *(5 constructs, 14 items)*
- Organizational support *(4 constructs, 10 items)*
- Implementation enhancement factors *(7 constructs, 21 items)*
- Organizational beliefs and expectations about compatibility *(2 constructs, 8 items)*
- Implementation processes and progress *(3 constructs, 11 items)*
- *Trust/Mistrust (2 items)*

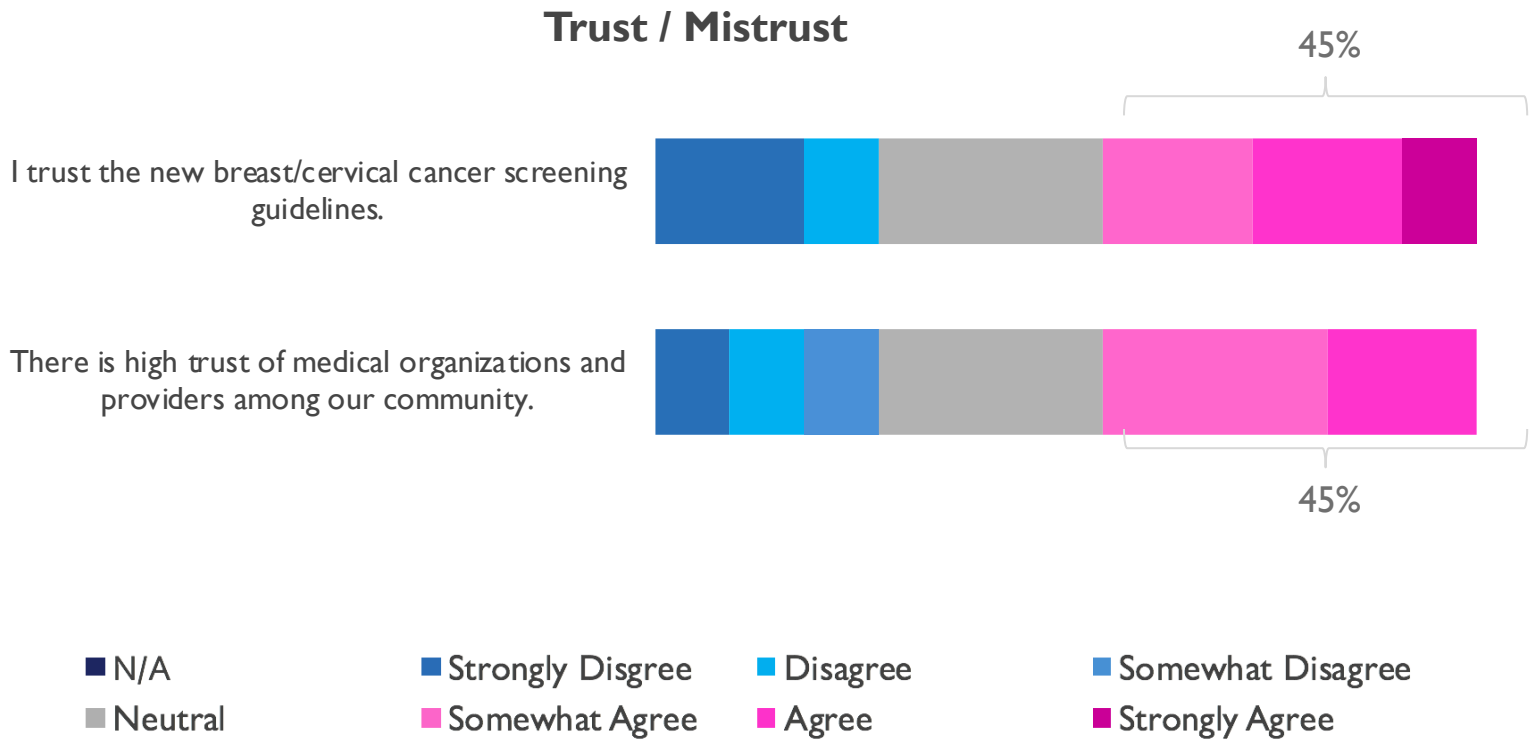
Table 1 Example questions

Domain/Construct	Sample question	Response scale	# Items
Decision and planning influences			
External group influence	To what extent did interest groups external to this organization have an influence on the decision to adopt the IMHP?	1: Not at all through 10: Great Extent	1
Field-Based Evidence	Organizations that have implemented the IMHP have evidence that it's an effective approach.	1: Strongly Disagree through 7: Strongly Agree	4
Risk management	We can deal with the "bumps in the road" associated with implementing the IMHP.	1: Strongly disagree through 7: Strongly Agree	5
Scientific evidence	There is considerable scientific evidence that the IMHP is effective.	1: Strongly disagree through 7: Strongly agree	3
Support from external organizations to adopt the IMHP	Overall, did external groups support the adoption of the IMHP?	1: Strongly opposed through 10: Strongly supportive	1

Massatti, R. R., Sweeney, H. A., Panzano, P. C., & Roth, D. (2008). The de-adoption of innovative mental health practices (IMHP): Why organizations choose not to sustain an IMHP. *Administration and Policy in Mental Health and Mental Health Services Research*, *35*(1-2), 50-65.

Why are sites not adapting to new guidelines?

Trust/mistrust among implementers and community is key and overlooked



Advancing Field of Sustainability Research

ANNUAL REVIEWS

Annu. Rev. Public Health 2018. 39:18.1–18.22

The *Annual Review of Public Health* is online at publhealth.annualreviews.org

https://doi.org/10.1146/annurev-publhealth-040617-014731

Copyright © 2018 Rachel C. Shelton et al. This work is licensed under a Creative Commons Attribution 4.0 International License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See credit lines of images or other third-party material in this article for license information

This article is part of a symposium on Implementation Science and Public Health. For a list of other articles in this symposium, see **http://www.annualreviews.org/toc/publhealth/39/1**

Annual Review of Public Health

The Sustainability of Evidence-Based Interventions and Practices in Public Health and Health Care

Rachel C. Shelton,[1] Brittany Rhoades Cooper,[2] and Shannon Wiltsey Stirman[3]

AJPH

A PUBLICATION OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

Sustaining Evidence-Based Interventions and Policies: Recent Innovations and Future Directions in Implementation Science

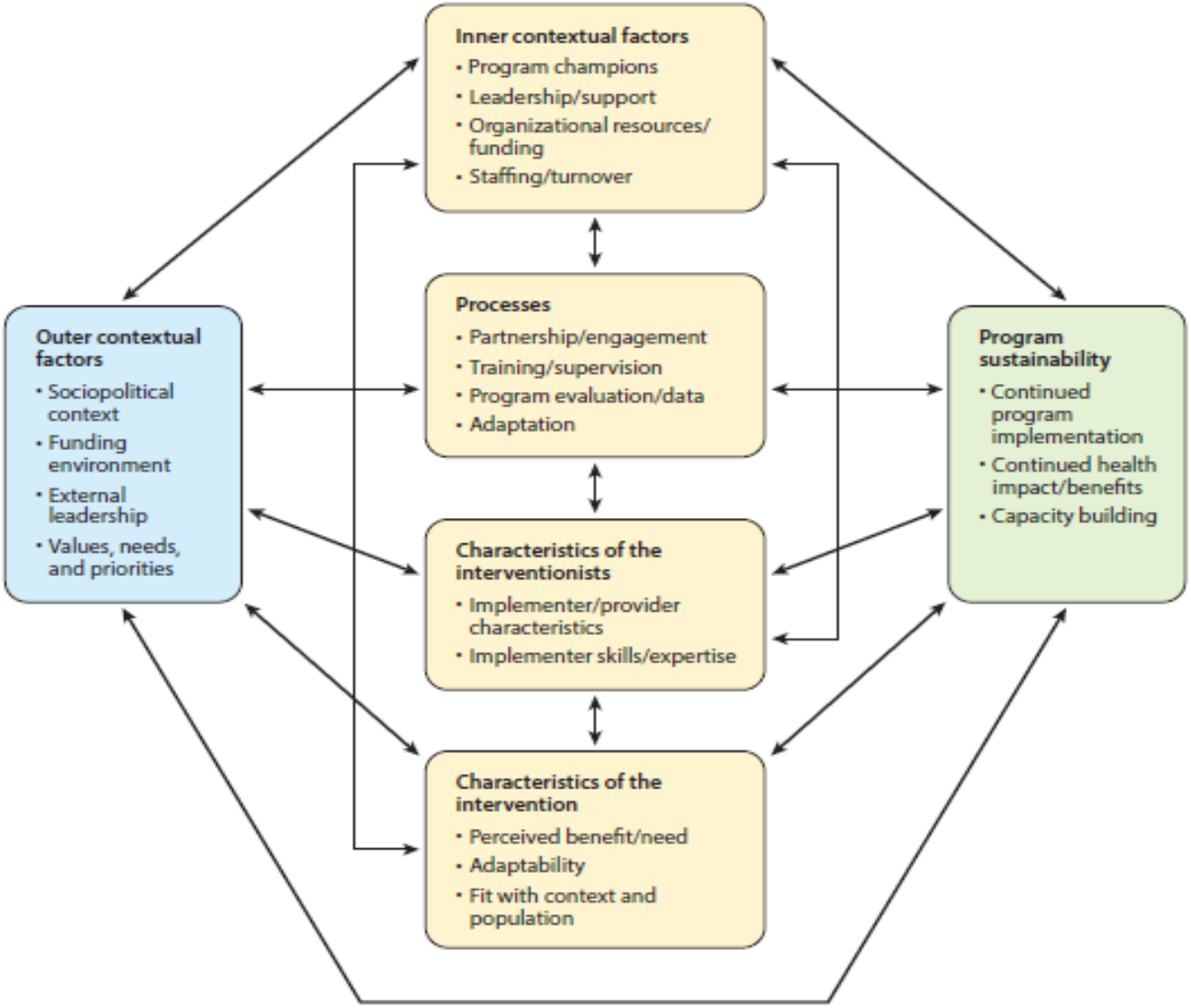
Rachel C. Shelton ScD, MPH, and **Matthew Lee** MPH

Moving the field forward…

- Sustainability increasingly conceptualized as **dynamic construct**: allows for adaptation or de-implementation in response to changing populations, evidence, contextual influences
- **Prospective, multilevel, mixed-methods study designs** ideal for studying sustainability; **longitudinal perspective**
- Research needed to identify and **evaluate planned strategies** to support the sustainability of EBIs in real-world settings
- Opportunities for studying **policy sustainability**
- **Conceptual and methodological guidance**: work from existing definitions and test conceptual frameworks; Measurement!

Shelton & Lee 2019, American Journal of Public Health

Integrated Sustainability Framework



Shelton, R. C., Cooper, B. R., & Stirman, S. W. (2018). The Sustainability of Evidence-Based Interventions and Practices in Public Health and Health Care. *Annual Review of Public Health, 39(1), null. doi:10.1146/annurev-publhealth-040617-014731*

Lots of Unanswered Questions

- Do same factors that influence **implementation** matter for **sustainability** or are they different?
- Do different factors matter for **different types of interventions**? **Settings? populations? Health topics?**
  - Health equity focus
- Are all factors **equally important** or do some factors matter more? Can some factors **compensate** for other factors?
- Do some factors matter more for **different sustainability outcomes?**
- What is the **return on investment** and value of sustainability?

Complexity of Sustainability Outcomes

Sustainability w/fidelity to original EBI

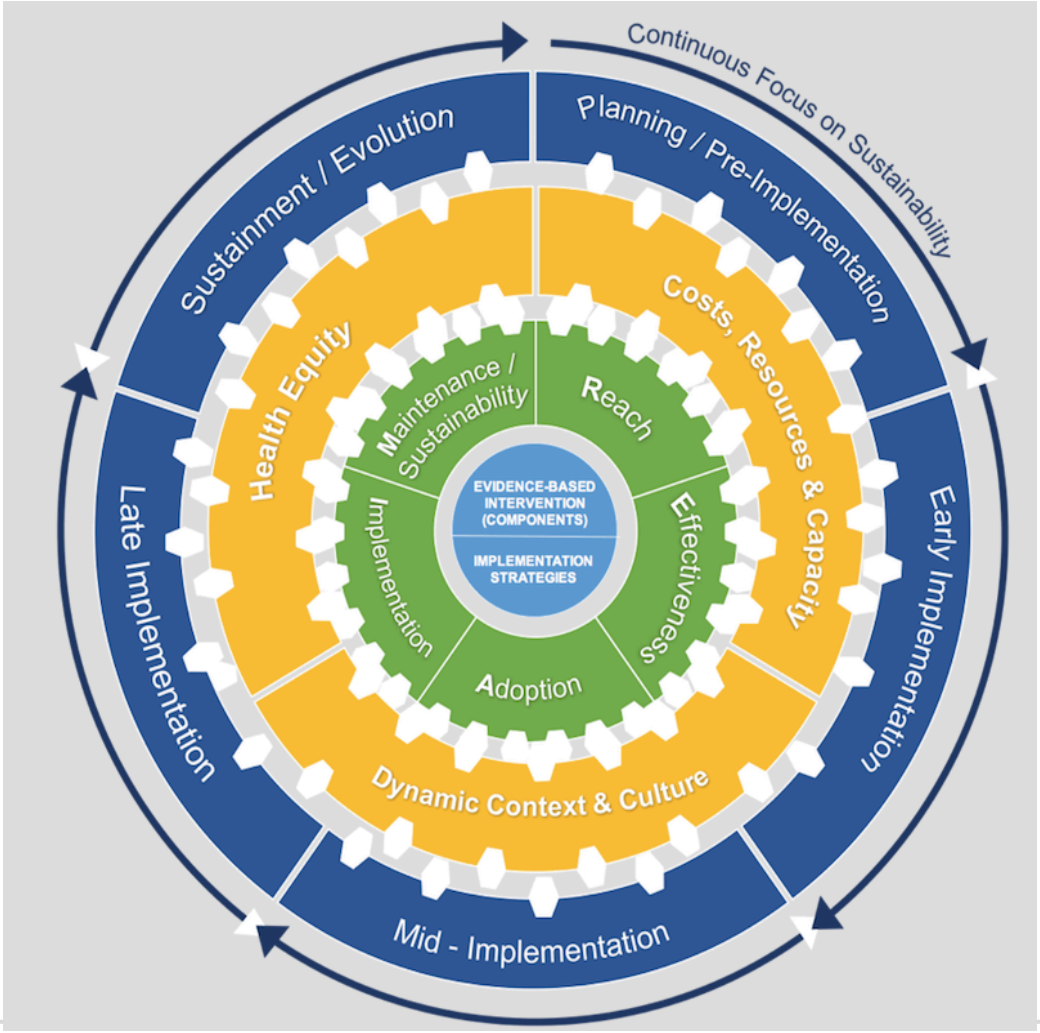
Adaptation due to changing contexts/evidence

De-implementation

COLUMBIA UNIVERSITY

An Extension of RE-AIM to Optimize Sustainment: Addressing Dynamic Context and Promoting Health Equity over Time

Rachel C. Shelton[1*], David A. Chambers[2], Russell E. Glasgow[3]



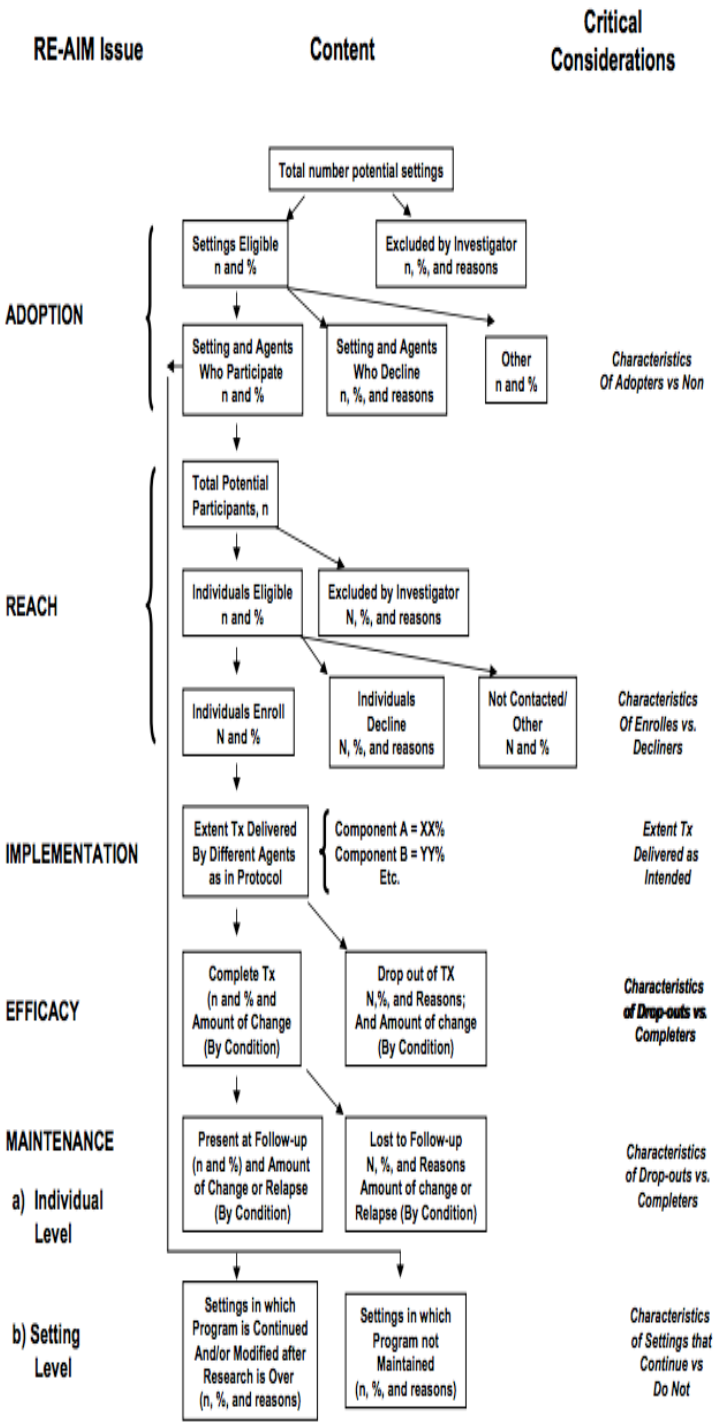
1) Extension of maintenance to include conceptualizations of dynamic, longer terms sustainability and evolvability across the lifecycle of EBIs (adaptation, de-implementation)

2) Iterative application of RE-AIM assessment to guide adaptations & enhance sustainability

3) Explicit consideration of equity & cost as fundamental forces to address across RE-AIM dimensions to enhance sustainability

COLUMBIA UNIVERSITY

Bringing Equity Lens to Extended Consort Diagram: RE-AIM



Moullin *et al. Implementation Science Communications* (2020) 1:76
https://doi.org/10.1186/s43058-020-00068-8

Implementation Science Communications

RESEARCH Open Access

Advancing the pragmatic measurement of sustainment: a narrative review of measures

Joanna C. Moullin[1,2], Marisa Sklar[2,3,4], Amy Green[2,5], Kelsey S. Dickson[2,6], Nicole A. Stadnick[2,3,4], Kendal Reeder[2,3] and Gregory A. Aarons[2,3,4*]

Methodology | Open Access | Published: 03 September 2020

Measurement of sustainment of prevention programs and initiatives: the sustainment measurement system scale

Lawrence A. Palinkas, Chih-Ping Chou, Suzanne E. Spear, Sapna J. Mendon, Juan Villamar & C. Hendricks Brown

Implementation Science **15**, Article number: 71 (2020) | Cite this article

1369 Accesses | **1** Citations | **22** Altmetric | Metrics

Key Considerations

- Determine what really constitutes sustainability of an EBI?
  - Sustained use of intervention? Continued use with fidelity? Use as evolved over time? Sustained partnerships? Health benefits?
- Establishing Timeframes
  - When is something considered sustainable? 1 year? 2 or more yrs?
- Operationalization: process vs. outcomes
  - Distinguish sustainability determinants from outcomes
- Strategies to support sustainability
  - Are the strategies for initial implementation different than those for sustainability? ERIC taxonomy of strategies

Systematic review | Open Access | Published: 06 June 2019

Evidence-based intervention sustainability strategies: a systematic review

Maji Hailemariam ✉, Tatiana Bustos, Barrett Montgomery, Rolando Barajas, Luther B. Evans & Amy Drahota

Implementation Science **14**, Article number: 57 (2019) | Cite this article

5642 Accesses | **9** Citations | **28** Altmetric | Metrics

Examples of Sustainability Strategies:

- Funding/contracting EBI for continued use
- Maintenance of workforce skills (booster training, ongoing supervisor feedback
- System adaptation to promote fit with organization over time
- Stakeholder prioritization and continued support of leadership
- Maintenance of staff buy in

Opportunities for Systems Science

Social Science & Medicine 220 (2019) 81–101

Contents lists available at ScienceDirect

Social Science & Medicine

journal homepage: www.elsevier.com/locate/socscimed

Review article

Use of social network analysis in the development, dissemination, implementation, and sustainability of health behavior interventions for adults: A systematic review

Rachel C. Shelton[a,*], Matthew Lee[a], Laura E. Brotzman[a], Danielle M. Crookes[b], Lina Jandorf[c], Deborah Erwin[d], Elizabeth A. Gage-Bouchard[d]

Acknowledgements

Co-Investigators: Lina Jandorf (Mount Sinai); Debbie Erwin (Roswell Park Cancer Institute); Hayley Thompson (Karmanos Cancer Institute/Wayne State University); Co-authors: Shannon Wiltsey-Stirman (Stanford); Brittany Cooper (Wash St); Matthew Lee (Columbia)

Staff Support: Sheba King Dunston, Nicole Leoce, Danielle M. Crookes, Thana-Ashley Charles, Detric 'Dee' Johnson, Laura Brotzman, Hiershenee Bhana

The Project Directors, Coordinators, LHAs, and Role Models from the National Witness Project who contributed their time to this study.

Funding: R03 grant from the National Cancer Institute (5R03CA150543-03, "Serving as a Lay Health Advisor: The Impact on Self and Community")

Provost's Award, Columbia University: Understanding De-implementation of Cancer Screening

American Cancer Society Research Scholar Grant for Health Equity: Sustainability of LHA Programs to Address Cancer Disparities

THE NATIONAL WITNESS PROJECT, INC.
AMEN CONFERENCE

Thank you!

Questions?

Rachel C. Shelton, ScD, MPH
Department of Sociomedical Sciences
Columbia University, Mailman School of Public Health
Director, Implementation Science Initiative, Columbia's Irving Institute/CTSA
rs3108@cumc.columbia.edu
@DrRachelShelton

LEAP Example
(Saunders et al.)

HEALTH EDUCATION RESEARCH

Vol.27 no.2 2012
Pages 319–330
Advance Access publication 8 December 2011

Assessing sustainability of Lifestyle Education for Activity Program (LEAP)

R. P. Saunders[1]*, R. R. Pate[2], M. Dowda[2], D. S. Ward[3], J. N. Epping[4] and R. K. Dishman[5]

[1]Department of Health Promotion, Education, and Behavior and, [2]Department of Exercise Science, Arnold School of Public Health, University of South Carolina, Columbia, SC 29208, USA, [3]Department of Nutrition, University of North Carolina, Chapel Hill, NC 29599, USA, [4]National Center for Chronic Disease Prevention and Health Promotion, Division of Nutrition and Physical Activity, Centers for Disease Control and Prevention, Atlanta, GA 30329, USA and [5]Department of Exercise Science, University of Georgia, Athens, GA 30602, USA

***Correspondence to: R. P. Saunders. E-mail: rsaunders@sc.edu**

Received on December 9, 2010; accepted on November 7, 2011

LEAP Example *(Saunders et al.)*

- **LEAP:** School based intervention targeting change in instructional practices and school environment to promote PA among high school girls
- 10 required and 6 recommended elements/core components (Table 1)
- Encouraged adaptation based on school resources and culture; had champion; ongoing training and TA; to improve fit and enhance implementation and sustainability
- More PA in intervention groups; and higher PA in higher implementer schools; sustained intervention effects 3 years post intervention

Saunders, R. P., Pate, R. R., Dowda, M., Ward, D. S., Epping, J. N., & Dishman, R. K. (2011). Assessing sustainability of lifestyle education for activity program (LEAP). *Health education research*, *27*(2), 319-330.

LEAP Example *(Saunders et al.)*

Table I. *LEAP essential element framework during active intervention and follow-up phases*

Component	Essential elements during active intervention [2, 4]	Essential elements for follow-up sustainability assessment
School environment	**Support for PA promotion from the school administrator**	**Support for PA promotion from the school administrator**
	Active school PA team	**Active school PA team**
	Messages promoting PA are prominent in the school	**Messages promoting PA are prominent in the school**
	Faculty/staff health promotion provides adult modeling of PA	**Faculty/staff health promotion provides adult modeling of PA**
	Community agency involvement	
	Family involvement	
	Health education reinforces messages	
	School nurse involved in PA	
	PA opportunities outside of PE	
Instructional practice	**Gender-separated PE classes**	**Gender-separated PE classes**
	Classes are fun	**Classes are fun**
	Classes are physically active	**Classes are physically active**
	Teaching methods are appropriate	**Teaching methods are appropriate**
	Behavioral skills are taught	**Behavioral skills are taught**
	Lifelong PA emphasized	**Lifelong PA emphasized**
	Non-competitive PA included in PE	**Non-competitive PA included in PE**

Bolded elements = required intervention elements; non-bolded elements = recommended intervention elements.

Saunders, R. P., Pate, R. R., Dowda, M., Ward, D. S., Epping, J. N., & Dishman, R. K. (2011). Assessing sustainability of lifestyle education for activity program (LEAP). *Health education research*, *27*(2), 319-330.

LEAP Example *(Saunders et al.)*

How did they define sustainability?

Continued presence of essential core components at FU; must include both school instructional practices and school environment; had to have evidence for implementation at two time points: 'higher implementation' at end of active intervention and 'implementation' at the three year FU

Data sources and data collection?

Interviewed LEAP team members, former PE teachers, students, observation of PE and school environment (Table 2)

Criteria for evidence of implementation at FU?

Triangulation of data from multiple sources; sustained LEAP if: 60% or more of essential core components were present, including at least one essential element from both instructional and environmental categories

Saunders, R. P., Pate, R. R., Dowda, M., Ward, D. S., Epping, J. N., & Dishman, R. K. (2011). Assessing sustainability of lifestyle education for activity program (LEAP). *Health education research*, *27*(2), 319-330.

LEAP Example *(Saunders et al.)*

Results (n=11 schools) at 3 year FU:

- 5 schools had 7-10 elements present at FU
- One school had none present at FU
- Overall, 4 schools met criteria for sustainability
  - Schools with sustainability had higher PA at FU

Saunders, R. P., Pate, R. R., Dowda, M., Ward, D. S., Epping, J. N., & Dishman, R. K. (2011). Assessing sustainability of lifestyle education for activity program (LEAP). *Health education research*, *27*(2), 319-330.

100