



# Developing a sustainability readiness strategy for health systems: Toolkit, interactive tools, and virtual support system

Knowlton Johnson<sup>a</sup>, David Collins<sup>a,\*</sup>, Abraham Wandersman<sup>b</sup>

<sup>a</sup> Pacific Institute for Research and Evaluation Louisville Center, 401 West Main Street, Suite 2100, Louisville, KY 40202, USA

<sup>b</sup> Wandersman Center, 1512 Laurel Street, Columbia, SC 29201, USA

## ARTICLE INFO

### Keywords:

Evidence-based intervention  
Sustainability readiness  
Health  
Prevention  
Treatment

## ABSTRACT

While the literature strongly supports the need for sustainability of evidence-based interventions (EBIs), we present a review of the literature that indicates only three articles discuss a health-focused sustainability strategy. The aims of our sustainability readiness strategy (SRS) are to increase infrastructure capacity and EBI advocacy to impact the level of sustainability readiness. In this article, we describe the development of an *evidence-informed promising practice* sustainability readiness strategy (SRS) with three evidence-based components. This strategy: 1) is based on an adaptation of the Getting To Outcomes® (GTO) evidence-based implementation process, 2) includes a logic model with documented evidence of the connection between targeted readiness factors and sustainability outcomes, and 3) describes resources considered necessary to support implementation of the readiness strategy, namely a step-by-step *Toolkit*, *Excel™ Tools*, webinar *coaching* and *evaluation guides*, and a *coaching and evaluation training guide*. The national SRS survey results are presented. Lessons learned and future dissemination and implementation plans are described.

## 1. Introduction

It is well documented that considerable resources have been spent to implement and validate evidence-based interventions (EBIs) to maintain or improve health (Creed, Wolk, Feinberg, Evans, & Beck, 2016; Karlin, Ruzek, Chard, Eftekhari, Monson, et al., 2010). Sustainability of EBIs for populations and individuals is needed (Friend, Flattum, Simpson, Nederhoff, & Neumark-Sztainer, 2014; Giesbrecht, Bosma, Juras, & Quadri, 2014; Flynn, Stevens, Bains, Kennedy, & Scott, 2022). We present a 20-year sustainability project that has drawn on lessons learned from the literature and a pilot study. It is presented as an *evidence-informed promising practice* sustainability strategy that would benefit from further implementation and efficacy study.

We present a review of the sustainability literature from 2010 to 2022 that focuses on EBIs and sustainability in selective health networks. Then we present reviews of the literature supporting our *evidence-informed promising practice* sustainability readiness strategy (SRS). The highlights of this article are details of our logic model; a data-driven, step-by-step process using an adaption of the Getting To Outcomes® (GTO) implementation model; and virtual coaching step-by-step components. A national feasibility study in one health sector (substance

abuse prevention and treatment) focusing on the need for a strategy like our SRS is presented. Lessons learned and future research are also discussed.

A wide variety of EBIs appears in the prevention and treatment literature. For example, in substance abuse prevention, there are: substance abuse prevention for school-based programs (Botvin, Griffin, & Nichols, 2006; Collins, Johnson, & Becker, 2007; Johnson, Shamblen, Ogilvie, Collins, & Saylor, 2009), family-based programs (Baumann, Powell, Kohl, Tabak, Penalba, et al., 2015; Cupp, Atwood, Byrnes, Miller, Fongkaew, et al., 2013), environmental strategies (Griffin & Botvin, 2010; Gruenewald, Treno, Holder, & LaScala, 2016; Holder, 2004), and Communities That Care (CTC) community interventions that are available for replication (Gloppen, Arthur, Hawkins, & Shapiro, 2012; Gloppen, Brown, Wagenaar, Hawkins, Rhew, et al., 2016). Other health promotion EBIs address threats concerning cancer (Umar, Dunn, & Greenwald, 2012; Valle, Tramalloni, & Bragazzi, 2015), heart disease (Towne, Smith, Ahn, Altpeter, Belza, et al., 2015; Wong, Toth, & Amsterdam, 2021), mental health (Bond, Drake, McHugo, Peterson, Jones, et al., 2014), oral health issues (Truman, Gooch, Sulemana, Gift, Horowitz, Evans, Griffin, & Carande-Kulis (2002)), and violence prevention programs (Malti, Ribeaud, & Eisner, 2011; Mihalic & Irwin,

\* Corresponding author.

E-mail addresses: [kwjohnson@pire.org](mailto:kwjohnson@pire.org) (K. Johnson), [collins@pire.org](mailto:collins@pire.org) (D. Collins), [wanderah@mailbox.sc.edu](mailto:wanderah@mailbox.sc.edu) (A. Wandersman).

<https://doi.org/10.1016/j.evalprogplan.2023.102241>

Received 10 December 2021; Received in revised form 8 December 2022; Accepted 19 January 2023

Available online 21 January 2023

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2003). Examples related to treatment include: substance abuse treatment (Courser, Johnson, Abadi, Shamblen, Young, et al., 2013; Johnson, Pan, Young, Vanderhoff, Browne, et al., 2008) and law enforcement and treatment training (Johnson, Young, Suresh, & Berbaum, 2002; Johnson, Shamblen, Young and Foster (2007)).

Demonstrating efficacy of an intervention is the first step in the process of impacting a population of focus, and the long-term outcome should be sustaining EBIs (Johnson, Hays, Center, & Daley, 2004). However, in comparison to the time and money devoted to establishing new EBIs, relatively little attention has been given to what happens to interventions once they have been successfully implemented in health services (Birken, Haines, Hwang, Chambers, Bunger, et al., 2020; Nadalin Penno, Davies, Graham, Backman, MacDonald, et al., 2019) and public health (Vitale, Blaine, Zofkie, Moreland-Russell, Combs, et al., 2018). One noted exception is the CTC strategy. The CTC strategy was found in a two-year, follow-up randomized controlled trial to have impacted sustainability of the strategy as designed (Gloppen, Brown, Wagenaar, Hawkins, Rhew, et al., 2016). Another exception is the GTO strategy focusing on implementation that informed our SRS model (Scaccia, Cook, Lamont, Wandersman, Castellow, et al., 2015; Domlyn, Scott, Livet, Lamont, Watson, et al., 2021). In a two-year cluster randomized trial, sites implementing a health EBI with the assistance of GTO were more likely to sustain the EBI two years later compared to sites implementing the same EBI on their own (Acosta, Chinman, Ebener, Malone, Cannon, et al., 2020). Health EBIs have focused primarily on successful implementation without creating assurances of “life of EBIs” after extramural funding has ended (Akerlund, 2000; Shediak-Rizkallah & Bone, 1998; Vaughn, Klingner, & Hughes, 2000). This is not a new statement or finding. What is alarming is the void in the literature on sustainability readiness strategies to assist health professionals in sustaining available EBIs. Understanding the sustainability of health EBIs is one of the most significant practice issues that funders and professionals face (Birken, Haines, Hwang, Chambers, Bunger, et al., 2020; Cooper, Bumbarger, & Moore, 2015; Gloppen, Brown, Wagenaar, Hawkins, Rhew, et al., 2016; Greenberg, Feinberg, Johnson, Perkins, Welsh, et al., 2015; McCabe, Ruberti & Endres, 2022; Scheirer & Dearing (2011); Shelton, Cooper, & Stirman, 2018).

We conducted a review of the sustainability literature from 2010 to mid-2022 using EBSCOhost and Google Scholar in search of journal articles and online publications. (See Appendix A for a discussion of the literature review method.) A total of 13 publications met the inclusion criteria of health and sustainability focus. Only three discussed the details of a health-focused sustainability strategy to sustain EBIs (Emekalam, 2012; Vitale, Blaine, Zofkie, Moreland-Russell, Combs, et al., 2018; Johnson, Collins, & Wandersman, 2013).

## 2. An innovative sustainability readiness strategy (SRS)

The SRS is based on three evidence-based features from prior research, which are: (1) a conceptual framework or logic model, (2) a data-driven, decision-making model with step-by-step toolkit and interactive tool, and (3) virtual coaching, which has been shown to be as effective as in-person coaching and more cost-effective. A second literature review, including results, provides an introduction to the discussion of each of our three evidence-based SRS features. Appendix B provides the literature review methods for these three reviews.

### 2.1. Conceptual framework

The SRS's conceptual framework stems from a second literature review. (See Appendix B1 and a pilot study conducted by the Pacific Institute for Research and Evaluation [PIRE] Louisville Center over the past 20 years [Johnson, Collins, & Wandersman, 2013].) In 2001, PIRE researchers engaged in a research and development sustainability project as part of a contract with the Southeast Center for the Application of Prevention Technologies (CAPT) and the Center for Substance

Abuse Prevention (CSAP). This project produced an often-cited (500 + references) sustainability planning model that was published in *Evaluation and Program Planning* (Johnson, Hays, Center, & Daley, 2004). The factors from this literature review were used to evaluate coalition capacity building in the Tennessee Strategic Prevention Framework State Incentive Grant (SPF SIG) (Collins, Shamblen, Harris, Johnson, & Dwivedi, 2009). A 2017 *Prevention Science* article authored by a team of researchers from PIRE and the University of South Carolina highlights the predictability of some of the SRS factors to long-term sustainability of EBIs implemented in the Tennessee SPF SIG CSAP initiative (Johnson, Collins, Shamblen, Kenworthy, & Wandersman, 2017).

Our logic model for the SRS was updated with a more recent literature review from 2010 to 2022 based on our predefined criteria. (See Appendix B1.) Table 1 defines and describes five infrastructure capacity factors (data resources, expertise, formalization, funding resource, and policies) and two advocacy factors (EBI and sustainability champions) found in the literature that predict sustainability of health interventions. Table 2 presents details of 12 studies found, seven of which (58%) were published in the last 10 years, that informed our final conceptualization. Nine studies showed a significant relationship between one readiness factor and sustainability outcome(s), and three studies (Bourgault, Heath, Hooper, Sole, Waller, et al., 2014; Hunter, Han, Slaughter, Godley, & Garner, 2015; Johnson, Collins, Shamblen, Kenworthy, & Wandersman, 2017) showed a significant association between more than one readiness factor and sustainability. For each study, the table details the authors, year of publication, health sector, sample size, and study design (prospective or retrospective) using criteria in Ranganathan and Aggarwal (2018) and analyses that demonstrate an association between a readiness factor and sustainability. Health sectors include clinical practice, preventive dental care, heart health promotion, substance abuse prevention and treatment, and violence prevention. Notes below the table provide additional information about the outcomes and analyses used.

A logic model, shown in Fig. 1 below, presents a conceptual view illustrating the interconnections of the set of evidence-based causal factors to the SRS and outcomes. Reading left to right, inadequate organization infrastructure and inadequate advocacy for sustainability are two evidence-based barriers to the sustainability of health EBIs. Four key resources that support implementation of the SRS are shown around the box that contains the strategy. These include a Toolkit, Excel™ Tools, a

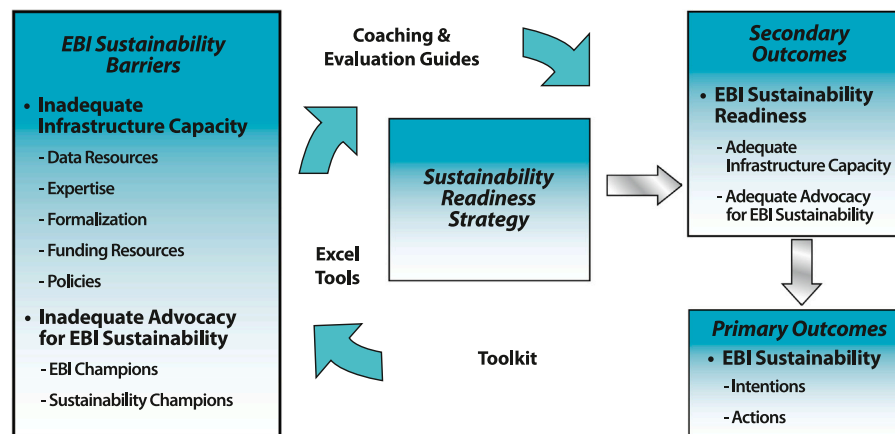
**Table 1**  
Sustainability Readiness Factors that Predict EBI Sustainability.

Sustainability Readiness Factors	Definition
Infrastructure Capacities	
Data Resources	Data resources that support use of the EBI and include county-level archival data, county-level survey data, evaluation data from EBI implementation, and state- or regional-level data
Expertise	Proficiency in obtaining funding for EBIs, planning, implementing (and monitoring implementation of) EBIs, and sustaining EBI(s)
Formalization	Structures and practices that facilitate operating processes, which support organizational functioning, including EBI planning, implementation, and sustainability
Funding Resources	External funding resources that support planning, implementation, and sustainability of EBIs (from federal, state, local government, foundation, and other sources)
Policies	Written policies that support implementing, monitoring, and sustaining EBI(s)
Member Advocacy	
EBI Champions	Members of the organization who proactively advocate for identifying EBIs to meet community needs and for implementing and monitoring implementation of EBIs
Sustainability Champions	Members of the organization who proactively advocate for eight evidence-based essential actions for sustainability of EBI(s)

**Table 2**  
Studies Showing Effects of Seven Sustainability Readiness Factors on Sustainability Outcomes.

Sustainability Readiness Factor	Authors (year of publication)	Health Sector	Sample Size	Study Design	Analysis
Data Resources	Sadof, Boschert, Brandt, & Motyl (2006)	Reduction of asthma morbidity	18 hospital sites	Retrospective	Fisher exact test
	Bourgault, Heath, Hooper, Sole, Waller, et al. (2014) <sup>a</sup>	Clinical practice	370 critical care nurses	Retrospective	Logistic regression
	Johnson, Collins, Shamblen, Kenworthy, & Wandersman (2017)	Substance abuse prevention	29 EBI implementations	Prospective / Retrospective	Zero-order correlations, linear mixed regression models
	Sainio, Herkama, Turunen, Rönkkö, Kontio, et al. (2020)	School anti-bullying program	1771 schools	Retrospective	Logistic regression
Expertise	Massatti, Sweeney, Panzano, & Roth (2008) <sup>a, b, c</sup>	Mental health practice	24 organizations	Retrospective	Mann-Whitney U tests
	Hunter, Han, Slaughter, Godley, & Garner (2015)	Adolescent substance use treatment	68 treatment organizations	Retrospective	Logistic regression, discrete-time survival analyses
Formalization	Livet, Courser, & Wandersman (2008) <sup>b, d</sup>	Substance abuse prevention	29 programs	Retrospective	Bivariate non-parametric correlation
	Johnson, Collins, Shamblen, Kenworthy, & Wandersman (2017)	Substance abuse prevention	29 EBI implementations	Prospective / Retrospective	Zero-order correlations, linear mixed regression models
Funding Resources	Cooper, Bumbarger, & Moore (2015)	Delinquency and violence prevention	77 programs in statewide initiative	Retrospective	T tests
	Hunter, Han, Slaughter, Godley, & Garner (2015)	Adolescent substance use treatment	68 treatment organizations	Dichotomous	Logistic regression, discrete-time survival analyses
	Johnson, Collins, Shamblen, Kenworthy, & Wandersman (2017)	Substance abuse prevention	29 EBI implementations	Prospective / Retrospective	Zero-order correlations, linear mixed regression models
	Bourgault, Heath, Hooper, Sole, Waller, et al. (2014) <sup>a</sup>	Clinical practice	370 critical care nurses	Retrospective	Logistic regression
Policies	Muilenburg, Laschober, & Eby (2014) <sup>a</sup>	Tobacco addiction treatment	1006 treatment programs	Retrospective	Negative binomial regression
	Hunter, Han, Slaughter, Godley, & Garner (2015)	Adolescent substance use treatment	68 treatment organizations	Retrospective	Logistic regression, discrete-time survival analyses
EBI Champions	Little, Pokhrel, Sussman, & Rohrbach (2015) <sup>a, e</sup>	Tobacco use prevention programs	205 school administrators	Retrospective	Structural equation modeling
	Scheirer (1990) <sup>a</sup>	Preventive dental care innovation	769 public school districts	Retrospective	Multiple regression
Sustainability Champions	O'Loughlin, Renaud, Richard, Gomez, & Paradis (1998) <sup>b, f</sup>	Heart health promotion	189 heart health promotion interventions	Retrospective	Polychotomous logistic regression

Notes: a - Adoption in context of diffusion of EBIs; b - A mixture of EBIs and non-EBIs; c - Compared predictors on de-adopter and implementer projects; d - Intentions to sustain; e - Indirect effect of champions on adoption in SEMs; f - Three levels of perceived permanence



**Fig. 1.** Sustainability Readiness Strategy Logic Model.

Coaching Guide, and an Evaluation Guide. This readiness strategy should impact sustainability readiness of EBIs that address health problems and are supported by published studies. If these secondary outcomes (i.e., mechanisms of change) are realized, increased sustainability readiness should stimulate the primary outcomes, which are intentions and actual sustainability of an EBI.

## 2.2. Data-informed decision-making process

A sustainability strategy should be *data-informed*. Evidence from the education field (Earl & Katz, 2006; Mandinach, 2012) shows that

data-informed decision-making, including the capacity for effective use of data, can help practitioners review current capacities, identify weaknesses, and plan for improvements.

We conducted searches from 2010 to 2022 of nine databases within EBSCOhost as well as additional searches through Google and within PubMed. (See Appendix B2 for the methods.) We found only two toolkits that included steps aligned with a step-by-step process: the *Guide to SAMHSA's Strategic Prevention Framework* and a set of *Getting To Outcomes® (GTO) Manuals* (published by RAND). Of these two toolkits, only the *GTO Manuals* (e.g., *Getting To Outcomes® Guide for Teen Pregnancy Prevention*) included tools to be implemented as part of the steps. Other

toolkits incorporated tools and checklists but lacked overall theoretical frameworks and steps aligned with the framework. The majority of toolkits were compilations of resources.

This search identifies sustainability literature focusing on interactive tools as part of one or more processes (Appendix B2). We found only two sustainability strategies using interactive tools. One is an earlier version of our current SRS that was an adaption of the GTO process with interactive step-by-step tools (Johnson, Collins, & Wandersman, 2013). GTO is an evidence-based process model that has been used successfully to address the implementation of health interventions (Acosta, Chinman, Ebener, Malone, Cannon, et al., 2020; Chinman, Acosta, Ebener, Malone, & Slaughter, 2016; Chinman, Acosta, Ebener, Malone, & Slaughter, 2018; Imm, Chinman, Wandersman, Rosenbloom, Guckenburg, et al., 2007). The other is the Program Sustainability Assessment Tool (PSAT) that provides data from an online, interactive tool as the first step of a sustainability process introduced in later, in-person training and technical assistance (TA) (Calhoun, Mainor, Moreland-Russell, Maier, Brossart, et al., 2014; Luke, Calhoun, Robichaux, Elliott, & Moreland-Russell, 2014; Schell, Luke, Schooley, Elliott, Herbers, et al., 2013; Vitale, Blaine, Zofkie, Moreland-Russell, Combs, et al., 2018).

Our SRS steps incorporate 11 questions, which are listed below, that address sustainability readiness. These SRS questions are an adaptation of the original GTO questions that focus on implementation of interventions in multiple health sectors.

1. Which EBI(s) meet the evidence-based sustainability selection criteria? (SELECT EBIs)
2. What are the organizational barriers (e.g., infrastructure capacity and member advocacy) to sustaining EBI(s)? (ASSESS PRE-READINESS)
3. What are the desired outcomes to increase readiness for sustainability of EBI(s)? (OUTCOMES)
4. What planning actions can achieve desired readiness outcomes? (ACTIONS)
5. How do these planning actions fit and are adaptations needed? (FIT)
6. What resources are needed to implement the actions? (RESOURCES)
7. What is the written plan to increase readiness for sustainability? (PLAN)
8. How will this plan be monitored to ensure the actions are implemented with quality? (IMPLEMENTATION MONITORING)
9. How well did the sustainability written plan achieve sustainability readiness? (ASSESS POST-READINESS)
10. What additional actions can continuously improve readiness for sustainability? (CQI)
11. Two months after implementation of the SRS, what are the intentions to sustain the EBI(s)? (ASSESS INTENTIONS)

This sustainability GTO step-by-step process is introduced to users in a 66-page toolkit as the key support resource. After collecting background information, the health organization is asked to identify an internal two- to three-member leadership committee and a workgroup (ideally comprised of three to five members). The committee and workgroup are asked to work with a trained external coach to complete toolkit tasks and timelines in a toolkit calendar over a 10-month period. (A coach, workgroup facilitator, and workgroup data coordinator are trained in Microsoft Excel™ before beginning the sustainability step-by-step GTO process.) If a workgroup facilitator or data coordinator plans to leave during the SRS 10-month intervention period, a successor would be trained prior to their predecessor's departure. An evaluator (internal or external) collects data and provides outcome results, which include two-month data on intentions to sustain EBI(s), as recommended in a calendar in the toolkit. An Excel™ spreadsheet is programmed to interactively interface with the step-by-step GTO process. Information

for some of the sustainability GTO questions is pre-populated to later questions to reduce the amount of work that must be done by the workgroup. In addition, formulas in tools calculate the sustainability readiness adequacy change. The Excel™ tools provide immediate feedback and reporting. It is important to have workgroup/facilitator members with some Excel™ expertise to manage data-processing-related tasks as needed. In addition to the requirement of expertise in Excel™, the SRS includes additional features designed to help ensure that the Excel™ tools are completed throughout SRS implementation by workgroups. These features include: training provided to the workgroup members prior to beginning the GTO process, the participation of the workgroup data coordinator in each virtual meeting (described below) guided by a toolkit calendar, and the provision of TA by the trained external coach in each of the virtual meetings. The evaluator manages the sustainability readiness outcome data tasks and the two-month assessment of intentions to sustain EBI(s). The workgroup facilitator presents results to a leadership committee in their respective health organization for review and comments. It is beneficial for the facilitator to be on the leadership committee.

The SRS implementation involves seven virtual meetings, including an initial startup meeting, to address the 11 sustainability GTO questions focusing on SRS implementation. The intentions assessment is implemented two months later in month 12. Results are delivered to the leadership committee for discussion. Table 3 presents the implementation process.

After selection of the sustainability leadership committee and sustainability workgroup, both groups participate in **Meeting 1** (Get Started), led by an external coach. Content is delivered via PowerPoint™ presentation. The coach reviews the toolkit and discusses leadership committee and workgroup functions, roles, and responsibilities. After each meeting, the coach provides consultation, and the workgroup facilitator provides a summary to the leadership committee.

**Meeting 2** focuses on sustainability GTO Question One to identify one to three EBIs to be sustained. We recommend focusing only on one EBI in implementing the first SRS 12-month process. Tool 1 is introduced, which highlights selection criteria based on EBI attributes or motivation factors found in published studies to be associated with sustainability outcome(s). In a 2020 literature search, we found four attributes to predict sustainability. These attributes and their working definitions are:

- compatibility – meets community needs, fits the values and culture of the community, and fits with other health efforts
- simplicity – perceived by members of the locally based organization
- ownership – established among supportive organization stakeholders
- relationships – developed between implementers and key stakeholders and include collaboration, trust, communication, and enthusiasm

The coach discusses these criteria and presents a hypothetical scenario illustrating how to use Tool 1 (Select Sustainable EBI[s]). The workgroup then identifies potential EBI(s) to sustain using criteria

**Table 3**  
Sustainability GTO Implementation and Evaluation.

Meetings / Evaluation	Content (Sustainability GTO Question)
Meeting 1	Get Started
Meeting 2	Select EBI(s) (Q1)
Evaluation	Assess Pre-Readiness (Q2)
Meeting 3	Outcomes (Q3)
Meeting 4	Select Actions (Q4), Fit (Q5), Resources (Q6)
Meeting 5	Written Plan (Q7)
Meeting 6	Implementation Monitoring (Q8)
Evaluation	Assess Post-Readiness (Q9)
Meeting 7	CQI (Q10)
Evaluation	Assess Intentions to Sustain EBI(s) (Q11)



outlined in the toolkit plus results from Tool 1 showing the level of adequacy of EBI attributes associated with sustainability. Fig. 2 illustrates Excel™ Tool 1 which focuses on one attribute (compatibility) that predicts sustainability. As the figure shows, workgroup responses to items are entered, and formulas in the tool produce adequacy results that are used to select EBI(s) to sustain. Inclusion of compatibility in Tool 1 helps address EBI alignment with organizational needs and capacities (Horner, Blitz, & Ross, 2014; Locke, Beidas, Marcus, Stahmer, Aarons, et al., 2016).

Sustainability GTO Question Two is addressed by the evaluator and

workgroup data coordinator. The SRS evaluator administers an online pre-readiness survey to the leadership committee and workgroup for data to assess readiness of the organization to sustain their chosen EBI(s). The survey includes items that measure the readiness outcomes in the logic model presented earlier. The items are scales and indexes from PIRE's Tennessee SPF SIG evaluation (Collins, Shamblen, Harris, Johnson, & Dwivedi, 2009) and sustainability study (Johnson, Collins, Shamblen, Kenworthy, & Wandersman, 2017). The data coordinator enters the SRS evaluator's interim results into Excel™ Tool 2 (Pre-Readiness [Baseline] Assessment Results). The tool is programmed to

**The Data Coordinator enters the name of an EBI and workgroup consensus responses to items about four EBI attributes associated with sustainability outcome(s). This example shows one attribute (Compatibility).**

## TOOL 1: Select Sustainable EBI(s) - Question 1

Show Help

NAME OF LOCALLY BASED ORGANIZATION	Six Counties Services Mental Health Board			
NAME OF FIRST EBI	Connect: A Trauma-Informed & Attachment-Based Program for Parents & Caregivers			
Please select the response that best fits your workgroup's consensus for each of the following items about four attributes.	Strongly disagree	Disagree	Agree	Strongly agree
<b>Compatibility</b>				
This EBI fits well with other health interventions implemented in the community.			x	
This EBI helps us meet the current needs of our community.			x	
This EBI is timely given the current needs of the community.				x
This EBI fits well with the culture and values of our community.			x	

**Level of adequacy of Compatibility is computed by formula in the Excel tool and is displayed at the bottom of the tool.**

	Not Adequate	Marginally Adequate	Adequate
Adequacy of Compatibility			x

Fig. 2. Illustrative Example of Excel™ Tool 1 (Select Sustainable EBI[s]).

calculate readiness adequacy scores for the five infrastructure and two levels of advocacy readiness outcomes for **Meeting 3**.

In **Meeting 3**, the coach guides workgroup members in answering Sustainability GTO Question Three. This action involves converting inadequate and marginally adequate readiness scores calculated in Excel™ to goal 1 outcome(s) statements at baseline. Tool 3 (Pre-Readiness Outcomes) shows outcome statements for each of the seven readiness factors. The statements are worded as maintaining those that are adequate and increasing those that are not adequate. The readiness goal 1 outcome(s) is only those for which workgroup action is needed to increase readiness. The goal 2 outcome (intentions to sustain) is acknowledged in this meeting, but its adequacy is not assessed until two months after the completion of the SRS.

**Meeting 4** addresses sustainability GTO Questions Four through Six and focuses on readiness planning actions. The workgroup reviews Tool 4 (Select EBI Sustainability Readiness Actions) and selects the readiness actions for each outcome stemming from inadequate or marginally adequate readiness scores. The tool includes specific actions and allows for additional actions to be selected based on the organization's needs.

Sustainability GTO Question Five focuses on fit of the selected readiness planning actions. The coach discusses fit (e.g., compatibility) and the workgroup completes Tool 5 (Fit of EBI Sustainability Readiness Actions) for each outcome's actions specified in Tool 4. The workgroup responds using consensus to items measuring each action's compatibility, simplicity, ownership, and relationships. These criteria are the same as those used to select EBI(s), but here, the workgroup assesses readiness action adequacy. The Excel™ tool calculates an adequacy of fit score for each action. The workgroup may decide to delete or replace readiness planning action(s) based on the results. Fit of readiness planning actions addresses the challenge of alignment with an organization's needs, preferences, and capacities (Horner, Blitz, & Ross, 2014; Locke, Beidas, Marcus, Stahmer, Aarons, et al., 2016).

Tool 6 (Resources for EBI Sustainability Readiness Actions) addresses Question Six which focuses on resources to implement each adequately rated readiness action after its fit review. Resources include human, fiscal, technical, and linkages needed to implement action(s) for outcome. The tool also addresses what is needed to get the resources.

**Meeting 5** entails writing a plan using Tool 7 (Sustainability Readiness Plan Template) to address Question Seven. This tool is a template for a written sustainability plan that specifies each readiness action, outlines tasks to be performed, and identifies the lead person and other key people needed to implement each task. The tool has space for up to 10 tasks per action with a scheduled completion date for each task.

For **Meeting 6**, implementation task data in Tool 7 are prepopulated to Tool 8 (Sustainability Readiness Plan Monitoring) to monitor readiness action implementation by task. To address Question Eight, the workgroup arrives at consensus responses for level of readiness action implementation. This assessment is based on five items: whether one person led implementation, whether others identified in the plan took part, whether needed resources were acquired, whether tasks were completed, and whether tasks were completed on schedule.

For sustainability Question Nine, the evaluator implements a post-assessment of the sustainability readiness outcomes using the same readiness survey and implementation protocol as in the pre-survey. The evaluator provides interim data to the workgroup data coordinator who enters it into Tool 9 (Post-Readiness Assessment Results), which calculates adequacy scores for each outcome.

**Meeting 7** concerns Continuous Quality Improvement (CQI) to assess Question Ten. Pre/post-readiness outcomes are prepopulated by Excel™ to Tool 10 (CQI Summary). The workgroup addresses outcome(s) that are not adequate at post-assessment and their confidence to address any inadequacy(ies). CQI is an important process to bring about change, including in healthcare (Silver, McQuillan, Harel, Weizman, Thomas, et al., 2016). Workgroup recommendations are communicated to the leadership committee for further action if needed.

Two months after the SRS 10-month implementation, the evaluator

surveys the committee and workgroup using an eight-item instrument adapted from the Level of Institutionalization (LoIn) scale (Goodman, McLeroy, Steckler, & Hoyle, 1993) to measure intentions to sustain the EBI. For Question Eleven, the evaluator calculates an intentions adequacy score with three categories (inadequate, marginally adequate, and adequate). The lower and middle thirds' responses of the summary score are designated not adequate, and the upper third is designated adequate. The leadership committee then decides whether to continue moving forward to sustain the EBI.

### 2.3. Webinar-based coaching and built-in evaluation services

A third evidence-based SRS feature is a support system consisting of webinar-based TA (coaching) and a low-cost evaluation by a third-party evaluator (or an internal evaluator). (Appendix B3 presents the search methods.) The review of the literature, including randomized controlled trials, has shown that virtual (web-based) coaching is comparable in efficacy to an in-person delivery system of coaching (Benjamin, Tate, Bangdiwala, Neelon, Ammerman, et al., 2008; Calo, Gilkey, Leeman, Heisler-MacKinnon, Averette, et al., 2019; Holt, Tagai, Santos, Scheirer, Bowie, et al., 2019; Rheingold, Zajac, Chapman, Patton, de Arellano, et al., 2015). Virtual coaching also confers the advantage of being able to provide coaching to a geographically diverse population of professionals (Benjamin, Tate, Bangdiwala, Neelon, Ammerman, et al., 2008). Research has also shown virtual coaching is significantly more cost-effective than in-person coaching (Calo, Gilkey, Leeman, Heisler-MacKinnon, Averette, et al., 2019). There is a trend toward greater use of online technologies as more cost-effective than other methods (Farr, Green, Bremner, Male, Gage, et al., 2021).

We have added a low-budget evaluation service, which includes a detailed guide for someone with research experience (e.g., a graduate student) to produce results to inform the workgroup and leadership committee. While there is no research supporting our evaluation services, we believe it is essential to provide SRS implementation results throughout the sustainability process. Our review found no strategy that included an evaluation of the sustainability readiness process.

We developed structured coaching and evaluation guides for the external coach and evaluator to follow throughout the implementation of the SRS strategy. The coaching guide has two sections. **Section 1** details each action (and lead person) listed in the Calendar Checklists of the *Sustainability Readiness Strategy Toolkit*. The reader is also referred to PowerPoint™ slides which contain content related to each action the coach leads. **Section 2** contains the PowerPoint™ slides that are referenced for each action in **Section 1**.

The coach will prepare for the seven meetings of the workgroup by developing a plan that includes each action listed below. For each action, the coach will use the talking points in the PowerPoint™ slides as an outline. The coach will draw additional content from the section of the *Toolkit* that addresses the appropriate question for each workgroup meeting. It is important to emphasize that the talking points in the PowerPoint™ slides should only serve as an outline. While the workgroup members are to read the entire *Toolkit*, the coach is responsible for including relevant content from the *Toolkit* in the presentations and when leading discussions in the meetings. The coach presents and leads discussions of the content during each meeting. Then the workgroup, led by the facilitator, reviews materials and completes tools using a consensus. The leadership committee and workgroup participate in Meeting 1; thereafter, the workgroup provides a summary to the leadership committee after each meeting. The coach should remain in the meeting to answer any questions.

The evaluation guide also has two sections. **Section 1** provides requirements for the external or internal evaluator with quantitative research skills, an overview of workgroup and evaluator actions, and details of evaluation actions to be implemented as part of the 10-month sustainability strategy plus a two-month follow-up. The evaluator may be the same person as the external coach. The evaluator should have

skills and experience in quantitative data analysis and should also be proficient with Microsoft Excel™ or a statistical analysis package (e.g., SPSS or R) in order to enter data and conduct only descriptive analysis and produce reports. It is important that data quality checks be conducted when entering data and that the data be cleaned and reviewed carefully (e.g., checked for missing values and out-of-range values) prior to analyzing the data and producing reports. [Section 2](#) presents the sustainability readiness and intentions instruments and detailed descriptions of formulative evaluation processes to follow, which include survey administration, data preparation, analysis computations and verifications, and leadership committee and workgroup report formats.

#### 2.4. Future dissemination of SRS

The question can be raised: do health organizations see the need for an SRS to assist in implementing EBIs? To answer this question, we conducted an interest and needs survey of state directors of the National Prevention Network ([Johnson, Collins, & Wandersman, 2021](#)). Sixteen of the 17 respondents (94%) “strongly agreed” or “moderately agreed” that organizations in their states had a need for additional training and TA on selecting and sustaining EBIs. Fourteen of the 17 respondents (82%) reported that they were willing to be contacted to identify/sponsor substance abuse prevention organization providers from their states. Seven reported that more than half (ranging from 51% to 100%) of the organizations they coordinate would be interested in receiving tools and TA to help them build readiness and capacity to sustain EBIs. ([Appendix C](#) reports the methods of this survey.).

### 3. Discussion of the SRS development process

#### 3.1. Development phases

This 20-year sustainability research and development (R&D) initiative should be considered a “family of R&D studies” with each building on experience and lessons learned. Phase 1 (of four phases) involved conducting a review of the sustainability literature and developing a planning model for the substance abuse prevention field ([Johnson, Hays, Center, & Daley, 2004](#)). This earlier version of our more recent sustainability strategy has been cited extensively (500 + EUCOR and Google Scholar citations) and has been adapted by others (e.g., [Greenberg, Feinberg, Johnson, Perkins, Welsh, et al., 2015](#); [Spoth & Greenberg, 2011](#); [Vitale, Blaine, Zofkie, Moreland-Russell, Combs, et al., 2018](#)).

In Phase 2, a lengthy toolkit, primer, and limited training and TA materials were developed around the GTO step-by-step implementation process for substance abuse prevention coalitions ([Johnson, Fisher, Wandersman, Collins, & White, 2009](#)). This toolkit and accompanying in-person training and TA were pilot tested using a small sample of prevention coalitions in five counties in Tennessee ([Johnson, Collins, & Wandersman, 2013](#)).

Phase 3 included a long-term sustainability study (5.5 years after the end of an initial grant) among substance abuse coalitions that allowed partial verification of a set of infrastructure and intervention attributes from Phase 1 as determinants of long-term sustainability of substance abuse EBIs ([Johnson, Collins, Shamblen, Kenworthy, & Wandersman, 2017](#)). We also revised our earlier sustainability strategy and support delivery system as an evidence-based SRS and expanded the focus from only substance abuse prevention to health organizations across multiple content areas. A forthcoming Phase 4 focuses on conducting a large-scale dissemination and implementation study in one health sector and developing a plan to disseminate the strategy in multiple health networks.

[Dearing and Lapinski \(2020\)](#) refer to a multi-solving innovation that may be a practice, program, policy, and technology, which offers benefits to more than one organization sector. Clearly, our SRS is this type of innovation. We began our 20-year journey in 2001 within one health

sector (i.e., substance abuse prevention), and now in 2021–22, we have expanded to any health sector, ranging from natural disaster innovations to V AIDHIV/AIDs prevention innovations to physical fitness.

#### 3.2. Lessons learned

There are a number of lessons learned that influenced the development of our SRS.

#### 3.3. Wide use

We learned from the systematic literature review presented in [Johnson, Hays, Center, and Daley \(2004\)](#) that our initial sustainability planning model partially filled an R&D vacuum at the turn of the 21st century. We mentioned the large number of citations of the 2004 article and examples of several prominent prevention scientists adapting the initial planning model. More importantly, our more recent literature reviews presented in this article found no published sustainability strategy that included: evidence-based conceptual framework, a data-driven step-by-step process, and a virtual support system of coaching and evaluation guidance. This body of evidence clearly supports the need for an SRS designed with evidence-based features.

In the beginning, our sustainability readiness strategy was designed to only focus on substance abuse prevention interventions being implemented as part of a federal grant or other start-up funds. Therefore, the strategy was viewed in a restrictive range, initially. The strategy presented here can be used in health generally.

#### 3.4. Evidence-based interventions

We found a range of standards for evidence-based interventions across health fields. For example, in the child welfare field, a widely recognized registry requires for its highest evidence rating two rigorous evaluations with positive results for an intervention’s primary outcomes ([California Evidence-based Clearinghouse for Child Welfare \(2021\)](#)). In the healthcare field, Cochrane reviews are used to determine the evidence for interventions. These are systematic reviews (meta-analyses) of all existing primary studies, both published and unpublished, on a topic using a common and specific methodology to limit bias and random error ([Cipriani, Furukawa, & Barbui, 2011](#)).

The criteria in our 2022 SRS for determining whether an intervention is evidence-based are that the EBI: (1) is listed in a recognized registry or (2) has outcome results from two or more published or unpublished evaluations. These evaluations should show evidence of positive effects using a control group design or an intervention-group-only design with pre-, post-, and follow-up assessments with large effect sizes.

To assist in selecting EBIs that have sustainable attributes, we made an adaptation in the original GTO to include a tool to assist organizations in selecting an EBI. Readiness is noted in the title, and a built-in SRS evaluation includes an assessment of readiness change and intentions to sustain. Adequate intentions are assumed to impact sustainability. The built-in evaluation provides adequacy results of baseline, post-SRS readiness, and post-only intention outcomes.

#### 3.5. Pilot study lessons

We learned from the 2009 pilot sustainability strategy ([Johnson, Collins, & Wandersman, 2013](#)) that coalition workgroups appreciated and benefited from completely or even partially implementing the GTO step-by-step sustainability process. Comments were made that the step-by-step process helped the sustainability workgroups identify and respond to specific barriers to building coalition capacity. Furthermore, it was reported that going through the sustainability process, as specified in the toolkit, provided benefits to strengthening coalition capacity beyond merely helping to sustain a particular prevention innovation with no guidance. Following are lessons learned from implementation of

the 2009 SRS version that were published in the 2013 pilot study (Johnson, Collins, & Wandersman, 2013).

The 2009 sustainability strategy featured a toolkit; primer; in-person, one-day training; three follow-up phone calls from the trainer; and Excel™ tools that reduced the workgroups' workload. However, the trainer had difficulty working with the 2009 toolkit because of its length, which was 200-plus pages, including the paper tools. Instead, the trainer developed the one-day training from the shorter 40-page primer. Because these training materials were general, rather than specific, future trainers who used this with other coalitions had little written guidance to implement the sustainability strategy. The 2022 SRS features a 66-page toolkit that includes all essential information; therefore, a primer is no longer needed. For the pilot study (Johnson, Collins, & Wandersman, 2013), coalition workgroups reported that the one-day training workshop was important; however, we learned that the workgroups of the pilot study struggled with getting a quorum for meetings. The implementation length of the 2009 strategy also had to be expanded from 8 months to 12 months, and not all of the coalitions finished the required meetings, even with the trainer providing telephone motivation consultation.

The pilot study results also suggested rethinking the structure of the 2009 sustainability strategy training and TA support system. Instead of training coalition workgroups with follow-up consultation, the SRS support system now consists of teleconferencing that includes a coach with a defined role. The coach, workgroup facilitator, and data coordinator receive a one-half-day training in their roles to implement the SRS. A coaching guide now provides more structure and consistency of the toolkit messages to assist future coaches and key SRS personnel. We also expanded the workgroup meetings to seven to cover the sustainability GTO questions presented in the toolkit with the coach leading and being available for questions at all meetings. In our pilot study, we found that workgroups had relatively low fidelity to what was planned in terms of convening meetings. This weakness is addressed in the 2022 SRS through virtual meetings in which the coach provides TA support to guide completion of all SRS workgroup tasks.

The 2022 SRS Excel™ tools remain as a support system resource, rather than paper or web-based tools. The decision to retain this tool was based on the workgroup members' assertion that the Excel™ tools were easy to use, and they especially appreciated the pre-population of other tools, which reduced the burden of many tasks. The use of electronic tools (Microsoft Excel™ Workbook) that include formulas to calculate ratings and populate subsequent worksheets within a sustainability toolkit is relatively new to the prevention field. We found no evidence in the literature of a sustainability strategy that includes the use of electronic tools throughout a step-by-step implementation process. To reinforce the ease of use of the Excel™ tools, we incorporated step-by-step instructions for tool completion that can be accessed through a "Show Help" button within each Excel™ tool. All tools and instructions are included in the toolkit. The workgroup facilitator and data coordinator are also trained to work with the coach in using the Excel™ tools at each step of the sustainability GTO process.

#### 4. Summary and concluding statements

The SRS is designed to sustain EBIs in health organizations by providing a comprehensive strategy of a toolkit and an evidence-based data-informed process with virtual coaching and built-in evaluation guidance. The goal is to increase infrastructure capacity and advocacy of one or more EBIs to produce an adequate level of organizational readiness for sustaining the chosen EBI(s). Assessing adequate readiness and intentions are built into the SRS. This strategy proposes that adequate readiness and intentions lead to continuation of the EBI as designed. Modifications of an EBI would have to be re-evaluated to ensure that they produce the benefits intended.

For a final dissemination Phase 4, we plan to integrate a social marketing and diffusion strategy, as promoted by Dearing, Maibach, and

Buller (2006) and Dearing, Rogers, Meyer, Casey, Rao, et al. (1996), that brings two different but compatible dissemination strategies (i.e., diffusion science and a business model) under one umbrella. This dual strategy should optimize dissemination success. While we agree sustaining an EBI is important to combatting many health problems, it is also important to recognize that newer EBIs may be able to outperform older ones. Stated differently, many EBIs may have a shelf life beyond which new innovations can outperform them. Although sustaining an EBI is not permanent, it is an essential step until a better evidence-based intervention replacement comes along. The GTO steps have been used successfully in multiple health sectors and content domains to help establish whether a better intervention should be used in the future. If yes, then that intervention should be sustained.

Several big-picture lessons have been learned. For example, while sustainability is often discussed and talked about as important by many stakeholders, our over 20 years of experiences show a major gap between "talk" and serious action on sustainability. Funders build it in as a requirement to address in their funding announcements; yet, truly sustaining EBIs with quality is rare. It takes a huge amount of effort to plan, implement, and then sustain an EBI beyond the initial implementation of it. Funders lose interest after the initial investment; practitioners get discouraged when something new always comes along; and even when hard-won accomplishments have been made, new shiny initiatives replace or grab attention away from well-implemented EBIs.

Our approach to helping problem-solve is to propose a comprehensive SRS that is: 1) strategic, 2) comes with practical tools, and 3) provides coaching and evaluation support. We believe that this is a necessary part of the solution to the gap between talk and action on sustainability. Practitioners and organizational leaders need a theory of how to sustain and what to sustain (GTO thinking) and then to develop a sustainability plan that is accompanied with specific steps and tools and that is supported by coaches to help navigate the challenges that are inevitably encountered in sustainability.

#### Acknowledgements

The authors wish to thank Drs. James Dearing, Pam Imm, and Steve Shamblen for their helpful comments on earlier drafts. We also acknowledge the helpful comments provided by the reviewers. We do appreciate the manuscript preparation assistance of Marilyn Thomas and Sharon Collins.

#### Appendix A. Methods for literature review of sustainability strategies

We conducted a search from 2010 to 2022 of nine databases within EBSCOhost as well as additional searches through Google Scholar and within PubMed. The review used the following predefined search criteria. First, we searched for articles and publications that focused on sustainability readiness strategies to continue health EBIs beyond their initial funding. Second, we used as keywords "sustainability strategy" and each of the following evidence-based features and delivery system resources: conceptual framework, step by step, coaching, technical assistance, toolkit, data-driven, interactive tools, and evaluation. The preliminary set of documents retrieved from an EBSCOhost search (377) and from a Google Scholar search (414) were reviewed for duplication within each search term combination. We eliminated from further review: webinars, commentary articles, articles describing future studies, and review articles (unless the focus of the review was on sustainability strategies). Two senior scientists reviewed each article to identify for inclusion those in a health sector with a substantive focus on sustainability.

#### Appendix B1. Methods for literature review of readiness factors

We conducted a search from 2010 to 2022 of nine databases within



EBSCOhost as well as additional searches through Google Scholar and within PubMed. We included studies of health-focused sustainability and included one or more of seven readiness factors: data resources, expertise, formalization, funding resources, policies, champions, and/or advocacy found in an earlier search of sustainability research studies. We identified at least two published studies showing a relationship between each of the seven readiness factors and one or more sustainability outcomes. At least two studies for each readiness factor found results that support sustainability of an EBI.

## Appendix B2. Methods for literature review of data-informed decision-making process

We conducted a search from 2010 to 2022 of nine databases in EBSCOhost and additional searches through Google Scholar. This search focused on toolkits in health-related areas with clearly identified steps that aligned with a framework using interactive tools for the steps that included sustainability as the last step. We used as search terms “interactive,” “tools,” and “sustainability.” Interactive tools were found in implementation of the 2009 SRS to be helpful to users in implementing a step of the strategy.

## Appendix B3. Methods for literature review of virtual coaching

We conducted a search from 2010 to 2022 of nine databases in EBSCOhost and additional searches through Google Scholar. We included studies that focused on the effectiveness and cost-effectiveness of virtual or web-based coaching (including in comparison to in-person coaching). We used as search terms “coaching,” “virtual,” “web-based,” “effectiveness,” and “cost-effectiveness.”

## Appendix C. Survey methods for an srs-focused national feasibility survey

In 2019 we conducted a survey of National Prevention Network (NPN) state directors to assess potential interest in and the need for sustainability readiness services among organizations that implement substance abuse prevention interventions. The survey also asked about the willingness of NPN representatives to identify/sponsor organizations from their states to participate in an implementation pilot study of PIRE's Sustainability Readiness Strategy. We surveyed state NPN directors over a two-month period on their interest in our SRS. We sent emails (with a fillable Word survey attached) to NPN directors for 48 states (two states had vacancies in this position during the data collection period). After the initial data collection, we sent a modified version of the survey to the director of a statewide coordinating agency and to the director of a sub-state (regional) coalition coordinating agency. We received completed surveys from 17 states (34% of 50 contacts). Fifteen respondents were representatives from state NPN directors' offices, one was the director of a statewide coalition coordinating agency, and one was the director of a sub-state (regional) coalition coordinating agency.

## Funding

This work was supported by a contract with the Southeast Center for the Application of Prevention Technologies (CAPT) and the Center for Substance Abuse Prevention (CSAP); by a contract through the CSAP-funded Tennessee Strategic Prevention Framework State Incentive Grant (SPF SIG); and internal funding including in-kind funding from the Pacific Institute for Research and Evaluation (PIRE) and the University of South Carolina Department of Psychology.

## CRedit authorship contribution statement

All authors contributed to the conceptualization of this article. Dr. Johnson wrote the initial draft with assistance from Drs. Collins and

Wandersman. All authors contributed to revisions of the article.

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- Knowlton Johnson, is a Senior Research Scientist II with the Pacific Institute for Research and Evaluation Louisville Center. He was previously on the faculty of the University of Louisville, University of Alaska in Anchorage and University of Maryland at College Park. He has received numerous awards and appointments including Board of Directors of the Knowledge Utilization Society, Co-Editor of the *Journal of Urban Affairs*, and the Michigan State University School of Criminal Justice's Wall of Fame. He is especially interested in the application of rigorous research designs and the dissemination and implementation (D&I) of evidence-based health interventions.
- David Collins, is a Research Scientist with the Pacific Institute for Research and Evaluation-Louisville Center. His areas of research include sustainability of evidence-based health interventions and capacity building and sustainability of community coalitions. He has led numerous evaluations of substance abuse prevention and family strengthening programs for youth and families and whole health programs for Veterans Administration clinicians.
- Abraham Wandersman, is President and CEO of the Wandersman Center and Distinguished Professor Emeritus at the University of South Carolina. He performs work in implementation science, program evaluation, community psychology, and transdisciplinary research and action at the Wandersman Center. Dr. Wandersman has received numerous awards for program evaluation and research and action. Dr. Wandersman has also served as President of the Society for Community Research and Action.