Steps to Implementing Evidence-Based Public Health Strategies

Chapter 3

Using evidence-based strategies (EBSs) in public health yields many benefits, primarily, investing limited dollars in strategies that have been shown to have a positive effect on outcomes. However, selecting, implementing, and evaluating EBSs is not a simple process. Research, preparation, and diligence are needed to properly implement EBSs. While EBSs have been evaluated and shown to produce positive outcomes, those outcomes are specifically tied to the implementation of the strategy. Thus, to replicate success, the strategy must be implemented in the same way as the original model program, clinical intervention, or policy. In addition, organizations interested in using EBSs must take other steps to ensure success. For example, it is important to collect health data and to conduct community health assessments before selecting evidence-based practices for implementation so that the intervention or strategy implemented is well suited to the context. Conducting health assessments and collecting health data (i.e., through surveillance or other mechanisms) are critical steps in defining and prioritizing health areas as well as in engaging community stakeholders.[1] The steps and the sequence thought to be required to implement EBSs successfully are outlined below:[a]

Research, preparation, and diligence are needed to properly implement evidence-based strategies

- Education on the Importance and Value of EBSs
- Priority Setting
- Selection
  - Determine what is known through scientific literature
  - Develop and prioritize program and policy options
- Implementation
  - Plan implementation
  - Determine core implementation components
    - Leadership Drivers
    - Competency Drivers
    - Organizational Drivers
  - Assess Performance
    - Continuous quality improvement
    - Staff performance/fidelity assessment
- Evaluation

a Adapted from Brownson RC, Fielding JE, Maylahn CM. Evidence-based public health: A fundamental concept for public health practice. *Annu. Rev. Public Health.* 2009;30:175-201.

Education on the Importance and Value of EBSs

Public health professionals represent a unique workforce. Local public health agencies employ professionals with varying experience and educational backgrounds. Some may have been exposed to evidence-based practice concepts through education or training, while many others have not.[2] Promoting a general understanding (e.g. through training) of the importance of using science to inform practice as well as the importance of monitoring and evaluation is critical to organizational change that is stimulating, meaningful, and lasting.

Priority Setting

Priority setting often involves collecting community-level data and engaging key stakeholders. In North Carolina, local health departments (LHDs) engage in a comprehensive community health assessment (CHA) process every three to four years. This process involves bringing community stakeholders together to work collaboratively to determine the factors influencing community health and the resources available to address these factors. These stakeholders include community leaders, public health agencies, businesses, hospitals, private practitioners, and academic centers.[3]

A general understanding of the importance of using science to inform practice as well as the importance of monitoring and evaluation is critical.

Once a CHA team is formed, primary and secondary data is collected. County health statistics are gathered as well as qualitative feedback from community members. The CHA team reviews and analyzes quantitative and qualitative data and then convenes a larger group to discuss findings and establish community health priority areas. This work lays the foundation for the selection and implementation of appropriate community-based public health interventions and policies.

Selection

Determine What is Known Through Scientific Literature

After identifying community health needs and other community variables, public health administrators and practitioners at the state, local, and community level can turn to the research and evidence that exists to aid in the selection of programs, policies, and clinical interventions.

There are many ways to identify individual EBSs. However, over the past decade, a number of organizations have begun to conduct systematic reviews of EBSs which has served to simplify the process *somewhat*. Systematic reviews, which use well-defined methods to evaluate published research, have helped to adapt and translate the growing research base of evidence based public health into

a more usable format for practitioners interested in identifying and reviewing evidence-based programs, clinical interventions, and policies.[1] Systematic reviews have been conducted by many different organizations (governmental, non-governmental, academic institutions, etc.) and have been released and published in a variety of formats. As discussed in Chapter 2, the US Preventive Services Task Force and the Community Preventive Services Task Force are tasked by the federal government with making evidence-based recommendations about clinical preventive services in a primary care setting and community preventive services, programs and policies, respectively. Both Task Forces have online guides to potential strategies as well as evaluations of their effectiveness. In addition to these two systematic review efforts, many other federal agencies, nonprofits, and academic organizations have systematic reviews of EBS available online including the Cochrane Collaboration, the Agency for Healthcare Research and Quality's Evidence-Based Practice Centers, and the Substance Abuse and Mental Health Services Administration's National Registry of Evidence-Based Programs and Practices (NREPP), all of which review specific programs, clinical practices, and/or policies. (See Appendix B for information on some of the online EBS guides that cover topics relevant to the mission of LHDs.)

Priority setting involves collecting community-level data and engaging key stakeholders to determine community health priorities.

Although significant variation exists among these and other systematic review resources, evidence-based registries often include information involving research quality/strength of evidence, the target population, implementation resources, and cost information. It is important to note that systematic reviews are not available for all public health topics.[4] While some areas, such as tobacco use, have extensive research available, others, such as the reduction in unintentional poisonings, have less information available.

Develop and Prioritize Program and Policy Options

Practitioners have noted that systematic reviews and original research often fail to include contextual information that can help inform whether a program or policy is a good fit for a particular community or context.[5] Although systematic reviews are an important tool used to identify community interventions, each EBS (and its target outcomes) must be considered in the context of many other factors. LHD staff bring important community knowledge and an understanding of local health issues which are critical to the selection and prioritization process. In reviewing potential EBSs for the correct community-fit, LHDs should consider a number of factors. Table 3.1 and Figure 3.1 highlight important factors for consideration.

When reviewing potential evidence-based strategies for the correct community fit, local health departments should consider a number of factors.

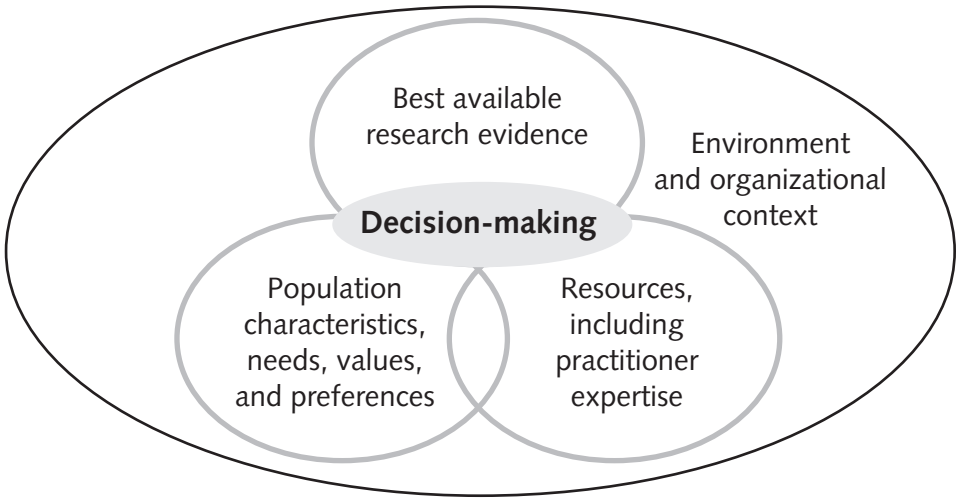
Table 3.1
Factors to Consider When Evaluating Evidence-Based Strategies

Factor	Specific Question
Size of the problem	• Is it important? • What is the public health burden?
Problem preventability	• What is the efficacy? • Can it work at least in ideal circumstances? • What do we know about the plausibility? Is it logical (theory-based)?
Intervention effectiveness	• What is the effectiveness? • Does it work in real-world settings? Would it work in the community settings being considered (is it generalizable to our community)? • How much less effective would it be compared with ideal settings? • Is there better evidence for alternative interventions?
Benefits and harms	• What are all the consequences of the intervention? • What are the trade-offs?
Intervention cost	• Is it affordable?
Comparison of benefits and costs	• What is the value? • How does it compare to other alternatives?
Incremental gain	• What are the additional costs and benefits (value) compared to what is already being done (if anything)?
Feasibility	• Are adequate time and money available?
Acceptability	• Is it consistent with community priorities, cultures, values, and the political situation?
Appropriateness	• Is it likely to work in this specific setting? • Are there ways to better understand the context for intervention in various populations?
Equitability	• Does it distribute resources fairly?
Sustainability	• Are resources and incentives likely to support conditions to maintain the intervention?

Anderson LM, Brownson RC, Fullilove MT, et al. Evidence-based public health policy and practice: Promises and limits. Am. J. Prev. Med. 2005;28(5 Suppl):226-230.

Asking such questions when reviewing potential EBSs can help LHDs gain the information needed to make well-informed decisions. Public health practitioners must weigh all the information obtained—about EBSs themselves, the needs and wants of the population they are serving, and the resources available—and make a decision about what will be the best fit for their organization and community. (See Table 3.1.) Ultimately, the level of evidence which supports a given program is just one factor among many important factors public health practitioners must consider. (See Figure 3.1.)

Figure 3.1
Domains that Influence Evidence-Based Decision Making



Source: Brownson RC, et al. *Annu. Rev. Public Health*. 2009;30:175-201.

Ultimately, the level of evidence which supports a given strategy is just one factor among many important factors public health practitioners must consider.

Policy Considerations

Introducing and passing new local policies requires the careful consideration of many factors discussed in Table 3.1 (e.g., what are unintended consequences, how does it compare to alternatives). However, moving policies forward also requires additional strategizing and coalition building. For example, understanding the various forums to introduce and pass policies (e.g. county ordinances, municipality referendums, local health department policies) and carefully timing the introduction of new policies is critical to implementation success. [6]

Implementation

Plan Implementation

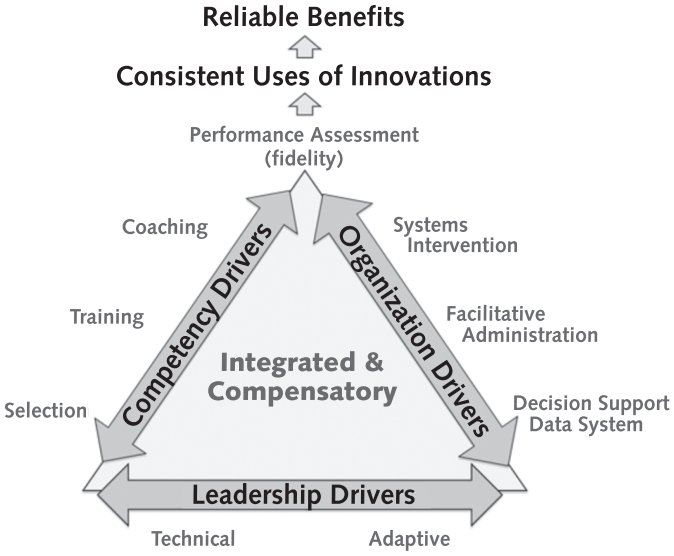
Once an EBS has been selected, implementation can begin. Before a program, policy, or clinical intervention becomes operational, organizational planning must occur. An implementation timeline should be created to detail and guide the sequence of implementation activities.

Additionally, program administrators (in consultation with state or national program experts) should discuss and define the core intervention components. Core intervention components are the key intervention elements which must be in place in order to achieve the desired outcomes. Adherence to these core intervention elements is referred to as implementation fidelity. Fidelity describes implementation quality and the degree of fit between the evidence-based model and the replicated intervention.[7] Research suggests that although fidelity should be maintained with regard to these functional components, "each core component may allow for flexibility in form (e.g. processes and strategies), without sacrificing the function associated with the component."[8] Implementing with a high level of fidelity requires careful planning, the alignment of organizational goals and capacity (e.g. leadership), as well as continuous staff support.

Implementation often occurs in phases. Organizations may pilot programs or interventions on a smaller scale before expanding to full implementation. This may mean training and utilizing a subset of staff and/or targeting a smaller group of initial participants. Piloting allows program administrators and staff to test programs and interventions on a smaller scale first; adjustments can then be made before implementing at full scale.

Determine Core Implementation Components

Figure 3.2
Domains that Influence Evidence-Based Decision Making



Source: Blasé KA, Van Dyke M, Fixsen DL, Bailey FW. Implementation science: key concepts, themes, and evidences for practitioners in educational psychology. In Kelly B, Perkins DF, eds. *Handbook of Implementation Science for Psychology in Education*. Cambridge, MA: Cambridge University Press; 2012:16.

Core implementation components (or "implementation drivers") are components which have emerged from the implementation literature.[8] (See Figure 3.2.) These components have been found to be essential to implementing EBSs with fidelity. These components should be addressed and maintained from initial implementation through full implementation. They are summarized below.

Leadership Drivers

Leadership forms the foundation for organizational change. Leaders are individuals who help organizations confront change, set direction, and build coalitions.[9] Leaders manage and mitigate internal and external factors so that change is possible.[8]

Leaders and managers of public health agencies face many challenges in shifting to an environment where evidence and innovation are able to consistently drive organizational decision making. Risk aversion and prescriptive governmental procedures and rules are just a few of the challenges public health leaders and managers face. However,

overcoming these obstacles is of critical importance, as achieving high public health system performance is directly related to science, quality, and performance in practice.[2,8]

Research has depicted leaders as individuals who help organizations confront change.[9] Leaders are direction setters and coalition builders. Leaders manage and mitigate internal and external factors so that change is possible. Leaders must be able to tackle both technical and adaptive problems as they arise. Technical problems typically are easier to identify; can be easily and quickly solved; and require change in one or a few places. In contrast, adaptive challenges are more difficult to identify; require changes in values, beliefs, roles, relationships, and approaches to work; require change across organizational boundaries; and require many people working together to solve the problem. Adaptive problems cannot be solved by edict, instead leaders must have the skills needed to identify the problem and then mobilize their organization through the changes needed to be successful.[8,10]

Core implementation components are those components that have been found to be essential to successful implementation.

Competency Drivers

Selection: Selecting staff with the experience and skills to complement and meet the needs of the program or intervention to be implemented is critically important. This may mean identifying existing staff or hiring new staff. A host of key roles need to be filled, each requiring different skills and experience. Practitioners work directly with program participants or consumers. Other organizational staff may include trainers, coaches, evaluators, and administrators. Finally, experts (often national program experts) support implementing organizations and staff to ensure successful program implementation as well as program fidelity.[8]

Training: Training is necessary for all staff. Training content will vary according to the program or intervention that is being deployed and according to staff roles and responsibilities. Implementation research suggests that, although training content will vary and be tailored to the specific program or intervention being implemented, delivery methods are frequently comparable. Initial training often occurs in a lecture format, where basic information is imparted (e.g. program history, program theory, core components). Engaging trainees in discussion and demonstration is also common. Additionally, involving training participants in role playing can be helpful preparation for working directly with program consumers or participants. Some trainings use established program training manuals as a guide while others do not.[8]

Coaching and consultation: Research has shown that "the essence of implementation is behavior change."[8] Classroom-type, theory-based training alone has been found to be an ineffective means for stimulating and maintaining behavior change.[11] Training which incorporates skill demonstrations has also been found to be ineffective for changing workplace practices. Even when participants are given the opportunity to practice new skills or behaviors in

training and are given feedback, still only a small percentage of participants have been found to implement the skills practiced in training successfully in their workplace environment. In contrast, when traditional training is supplemented with active and ongoing practice-based coaching and consultation, the vast majority of participants are able to successfully implement new skills or behaviors in their workplace.[8,11] (See Table 3.2.)

Table 3.2
Percent of Participants who Demonstrate Knowledge, Demonstrate New Skills in a Training Setting, and Use New Skills in the Classroom

Training Components	Knowledge	Skill Demonstration	Use in Workplace
Theory and discussion	10%	5%	0%
Theory and discussion + demonstration in training	30%	20%	0%
Theory and discussion + demonstration in training +practice and feedback in training	60%	60%	5%
Theory and discussion + demonstration in training +practice and feedback in training + coaching in Classroom	95%	95%	95%

Joyce B, Showers J. Student Achievement through Staff Development. Ed. Anonymous 3rd ed. Alexandria, VA: Association for Supervision and Curriculum Development; 2002.

Coaching and consultation activities include supervision, teaching while engaged in practice activities, assessment and feedback, and the provision of emotional support. Coaching and consultation are important because they allow staff to get on-the-job feedback and encouragement as they learn new skills and practices. Research shows that having robust training, with all the components discussed in this section, is critical to successful adoption of new behaviors and practices.[8]

Organizational Drivers

Facilitative administration: Internal organizational structures and procedures must be in place to direct and support selection, implementation, and evaluation of EBSs. For an LHD, this may include changing paper or electronic forms to include new information, developing new patient education materials, or setting up new billing codes.[8]

Decision support data systems: Data systems must be in place to enable data collection, analysis, and reporting. To comply with funding requirements, most programs need a mechanism for the collection of data. Program data can also be a powerful tool for program administrators. Data can reveal important

relationships as well as track progress towards achieving intended outcomes. Data are critical for short-term evaluation (e.g. through continuous quality improvement efforts) as well as long-term evaluation.[8]

Systems intervention: Administrators must also ensure external factors and influences (e.g. political support, funding) align with or allow for implementation activities and goals. This often involves working toward eliminating or reducing barriers which could impede implementation progress.[8]

Assess Performance

As discussed earlier, programs and interventions with a strong base of evidence (i.e. CDC levels best and leading) should achieve positive outcomes when implemented with fidelity. Rigorous (and repeated) evaluation efforts have established effectiveness for interventions at the best and leading levels which should preclude the need for further intensive, long-term evaluation. However, assessing implementation fidelity and monitoring immediate program/intervention outcomes remains an important step in the EBS implementation process. To rapidly assess and monitor evidence-based programs and interventions, administrators often use continuous quality improvement methods and program fidelity scales. These methods are discussed in more detail below.

Continuous Quality Improvement

Quality improvement (QI) refers to "a continuous and ongoing effort to achieve measurable improvements in the efficiency, effectiveness, performance, accountability, outcomes, and other indicators of quality in services or processes which achieve equity and improve the health of the community. [12]" QI methods can be used continuously throughout the process of implementing EBSs to monitor and manage organizational change.

The Model for Improvement is an example of a QI framework used to test and implement changes as well as assess implementation success.[13] The Model for Improvement is widely used in public health settings in North Carolina (and nationally) as well as by community partners, such as businesses, hospitals and physician practices.[14] The Model addresses three key questions regarding implementation[13]:

1. What are we trying to accomplish?
2. What changes do we need to make to accomplish improvement (i.e., core implementation elements)?
3. How do we know the changes resulted in improvement (assessment)?

Another key component of this model is the Plan-Do-Study-Act (PDSA) cycle, which is used to test and evaluate small changes (before programs are brought to scale) so that intervention effects can be systematically analyzed. PDSA cycles help to engage administrators in rapid-cycle monitoring to ensure outcomes

are being achieved, or program/intervention adjustments are being made when necessary.[15]

While an EBS focuses on "doing the right thing," QI efforts focus on "doing things right." EBSs prescribe practices that have been proven to produce outcomes whereas QI efforts focus on achieving high performance and efficiency throughout public health, regardless of the programs, clinical interventions, or policies that the LHD is implementing.

Staff performance and fidelity assessment

Performance assessment is an important milestone in the implementation process. Performance expectations and assessment frequency should be described and discussed with staff during initial training and orientation sessions. Staff performance evaluations should connect to knowledge and competencies acquired in training and refined through ongoing coaching/consultation. Performance evaluations may assess individual performance related to overall organizational performance or may assess performance related to adherence to research protocols, including core intervention components. Evaluators use program fidelity scales to assess adherence to program models and research protocols. Local program implementers can often gain access to fidelity scales through national program contacts or through the contacts listed in evidence-based registries.

Fidelity to the model is critical as research shows that higher levels of fidelity are correlated with achieving better outcomes.

Research describes three types of common fidelity measures: context, compliance, and competence.[8] Context measures assess implementation according to basic operational principles or aspects (e.g., staff qualifications, location of services). Compliance measures assess fidelity to identified core implementation components. Competency measures assess the skill of practitioners in adhering to core implementation components while appropriately addressing participants/consumers who present unique and varied situations, contexts, and needs.

Staff performance assessments and fidelity scales often include observational assessments, case file/document reviews, and stakeholder input. Evaluators require specific training around conducting performance evaluations and completing fidelity scales. Assessing fidelity to the model is critical as research shows that higher levels of fidelity are correlated with achieving better outcomes. Assessing fidelity can also help to inform and reinforce key training and coaching areas of focus.[8]

Evaluation

Where evidence is still accumulating in certain topic areas (e.g. at the promising and emerging levels), evaluations can help answer important questions regarding the outcomes and impact of the intervention. Administrators who invest significant time and resources to implement innovative or emerging policies,

programs, or clinical interventions should conduct longer-term evaluations to determine program effectiveness and to contribute to the field of evidence-based research.

In contrast, where the evidence-base is already quite solid (e.g. at the best and leading levels) there is less of a need for intensive evaluation. That does not mean that no outcome data should be collected. Rather, in cases where best and leading EBSs are being implemented, administrators should collect basic evaluation data to illustrate the impact of the program, clinical intervention, or policy, but do not need to do the kind of in-depth data collection and analysis that should be conducted when the outcomes of the intervention are less certain or not as well documented.

Regardless of the level of EBS being implemented, public health administrators should consider and plan for evaluations from the beginning. As discussed earlier, building data collection systems to house critical data elements is important because such systems allow for immediate monitoring and adjustment as well as long-term evaluation.

Policy Considerations: Policies that are passed must also be evaluated to assess the effectiveness of implementation and their ultimate impact. Policy evaluations may evaluate process as well as outcomes and may be short-term or long-term designs.[6]

Evaluations can help answer important questions regarding the outcomes and impact of the intervention.

References

1. Jacobs JA, Jones E, Gabella BA, Spring B, Brownson RC. Tools for implementing an evidence-based approach in public health practice. *Prev. Chronic Dis.* 2012;9:E116.

2. Brownson RC, Fielding JE, Maylahn CM. Evidence-based public health: A fundamental concept for public health practice. *Annu. Rev. Public Health.* 2009;30:175-201.

3. Division of Public Health, North Carolina Department of Health and Human Services. Community Health Assessment. http://www.healthycarolinians.org/assessment/guidebook.aspx. Published January 25, 2012. Accessed July 26, 2012.

4. Anderson LM, Brownson RC, Fullilove MT, et al. Evidence-based public health policy and practice: Promises and limits. *Am. J. Prev. Med.* 2005;28(5 Suppl):226-230.

5. Green LW, Glasgow RE, Atkins D, Stange K. Making evidence from research more relevant, useful, and actionable in policy, program planning, and practice: Slips "Twixt cup and lip". *Am. J. Prev. Med.* 2009;37(6, Supplement 1):S187-S191.

6. Silberman P. Discussion and Potential Recommendations. Presented to: the North Carolina Institute of Medicine Task Force on Implementing Evidence-Based Strategies in Public Health; April 30, 2012; Morrisville, NC. http://www.nciom.org/wp-content/uploads/2012/02/SilbermanTFdiscussion-programs.pdf. Accessed July 24, 2012.

7. Mihalic S. Center for the Study and Prevention of Violence, Institute of Behavioral Science, University of Colorado Boulder. Implementation Fidelity. http://www.colorado.edu/cspv/blueprints/Fidelity.pdf. Accessed August 10, 2012.

8. Fixsen DL, Naoom SF, Blase KA, Friedman RM, Wallace F. Implementation Research: A Synthesis of the Literature. National Implementation Research Network, University of South Florida. http://nirn.fpg.unc.edu/sites/nirn.fpg.unc.edu/files/resources/NIRN-MonographFull-01-2005.pdf. Published 2005. Accessed July 16, 2012.

9. Kotter JP. What leaders really do. *Harv. Bus. Rev.* 2001;79(11):85-96.

10. Heifetz R. *Leadership without Easy Answers.* Cambridge, MA: Belknap Press of Harvard University Press; 1994.

11. Joyce B, Showers J. *Student Achievement through Staff Development.* 3rd ed. Alexandria, VA: Association for Supervision and Curriculum Development; 2002.

12. Riley WJ, Moran JW, Corso LC, Beitsch LM, Bialek R, Cofsky A. Defining quality improvement in public health. *Journal of Public Health Management & Practice.* 2010;16(1):5-7.

13. Langley GJ, Moen RD, Nolan KM, Nolan TW, Norman CL, Provost LP. *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance.* 2nd ed. San Francisco, CA: Jossey-Bass; 2009. 515.

14. Randolph GD, Lea CS. Quality improvement in public health: Moving from knowing the path to walking the path. *Journal of Public Health Management & Practice.* 2012;18(1):4-8.

15. Institute for Healthcare Improvement. How to Improve. Institute for Healthcare Improvement website. http://www.ihi.org/knowledge/Pages/HowtoImprove/. Published September 9, 2011. Accessed July 31, 2012.