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Disseminating Policy and Environmental Change Interventions: Insights from Obesity Prevention and Tobacco Control

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Abstract
Background Public health and other practitioners increasingly are being asked to implement policy and environmental change interventions, yet many practitioners lack the knowledge, skills, and resources to do so. In response to this need, a growing number of organizations are disseminating evidence-based interventions (EBIs) and building practitioners' capacity to use those interventions in practice. Although advances have been made on approaches to disseminating individual-level EBIs, little is known about the optimal way to disseminate EBIs to promote policy and environmental change.
Purpose This paper describes the approach that two projects developed to disseminate policy and environmental change interventions. The Center for Training and Research Translation (Center TRT) disseminates EBIs to promote physical activity and healthy eating. Counter Tobacco disseminates EBIs to counter tobacco product sales and marketing in the retail environment.
Method Both Centers (1) identify the best available evidence, (2) disseminate menus of intervention strategies, (3) provide implementation guidance, (4) incorporate stories from the field, (5) build practitioners' capacity, and (6) integrate dissemination into practitioners' existing social networks. The Centers' process evaluations included website analytics and online surveys.
Result Over 26,000 unique visitors accessed the Center TRT website in 2012 and over 17,000 have accessed Counter Tobacco's site since its launch in August 2011. The majority of respondents to Centers' surveys agreed that resources were easy to access and use.
Conclusion Both Centers have had success reaching their intended audiences. Research is now needed to assess the extent of practitioners' use of Center resources and the impact of the resulting interventions.

Keywords Dissemination · Obesity prevention · Tobacco control · Public health · Evidence-based practice · Research translation

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Introduction

To be successful, efforts to improve health behaviors must include "upstream" changes to public and organizational policy and social, economic, communication, and physical

environments [1]. These policy and environmental (P&E) change interventions are essential to creating contexts that are more supportive of health behaviors and help "make individuals' default decisions healthy [2]." Practitioners being asked to lead P&E change are housed in departments of public health and a variety of other settings (e.g., schools, health care agencies, nonprofit organizations) and work across sectors to promote school nutrition standards, restrict tobacco product sales and marketing, create walking paths and bike lanes, and other P&E interventions [3, 4]. Unfortunately, many practitioners report that they lack the knowledge, skills, and resources needed to engage in effective P&E change [5–7]. In response to this need, a growing number of academic, government, and foundation-led organizations are working to disseminate evidence-based interventions (EBIs) and build practitioners' capacity to change P&E [8–11]. However, little is known about how these support organizations might tailor their dissemination and capacity-building efforts to the distinct needs of practitioners working to promote P&E change.

The predominant approach to disseminating EBIs may be a poor fit with P&E interventions. Most disseminating organizations focus on standardizing EBIs into a format that practitioners might replicate in their practice settings [12–14]. This approach has limited applicability for practitioners working to change P&E, because of the unpredictable nature of P&E change, which often emerges out of interactions within complex systems over which practitioners have only limited control [15–17]. As a result, practitioners cannot simply adopt and adapt interventions that worked in other settings [6]. Compare, for example, two interventions aimed at increasing physical activity, one is an afterschool program and the other a "complete streets" policy requiring all street construction to meet specified cyclist and pedestrian accessibility criteria. To implement the afterschool program, practitioners might select an EBI (e.g., "Youth Fit for Life" [18]), identify partners, and then adapt and implement the EBI in practice. In contrast, to enact complete streets policy, those same practitioners would need to collaborate with colleagues in the city's departments of planning and transportation and enlist additional partners (e.g., local businesses) to advocate for change. The practitioners could not predetermine policy content or format (e.g., ordinance versus resolution). Instead, the policy would emerge over time, in response to collaborating agencies' and community partners' priorities, practices, and resources, as well as existing infrastructure [19]. And, unlike the afterschool program, intervention implementation might continue indefinitely. As illustrated, the boundaries and components of P&E interventions may be difficult to specify, raising questions about what constitutes a P&E EBI and how best to disseminate EBIs to guide practice.

This paper details the dissemination approach that two US Centers for Disease Control and Prevention (CDC)-funded projects developed to disseminate P&E EBIs to local- and state-level practitioners nationwide. Since 2004, the Center for Training and Research Translation (Center TRT) has disseminated EBIs related to physical activity, food, and breastfeeding P&E with the goal of preventing obesity. Counter Tobacco was launched in 2011 to promote P&E change related to tobacco product sales and marketing in the retail environment, also known as the point of sale (POS). This paper aims to describe the two Centers' rationale for their dissemination approach, specific dissemination and capacity-building strategies, and findings from preliminary evaluations of practitioners' use and perceptions of the Centers' resources.

Distinct Features of P&E Interventions

Several features of P&E interventions distinguish them from other types of behavioral change interventions and are central to identifying the best approaches to dissemination. The distinct features of P&E interventions are summarized in Table 1 and described in detail below.

Evidence for P&E Interventions is Emerging A robust and growing body of evidence supports the relationship between P&E change and health behaviors, and the evidence base for effective P&E interventions is emerging rapidly [4, 20–26]. In fact, the rapid emergence of evidence is one of the central challenges for those disseminating P&E EBIs [1, 27, 28]. A second and even greater challenge is the dearth of guidance on how to implement P&E interventions into practice.

P&E Change is Complex P&E interventions function within complex systems comprised of diverse stakeholders engaging in multiple, interrelated activities across multiple levels [29, 30]. Because collaborating stakeholders represent diverse settings and sectors, they approach intervening with differing needs, resources, and values. Engaging and retaining stakeholders is central to effective P&E change [31–33] and requires the ongoing alignment of interventions with stakeholder priorities and with other system elements as the intervention and its implementation evolve over time [29, 34–36]. The complex, context dependent, and evolving nature of P&E interventions challenges disseminating organizations' efforts to identify their boundaries (e.g., where do they begin or end) or to standardize intervention activities and materials into a format that can be replicated by others.

To illustrate, public health practitioners wanting to increase access to fruits and vegetables, may identify several relevant EBIs (e.g., increasing availability within existing retail settings, financing new retailer development) [37]. Because practitioners require partners to promote and implement these interventions, they begin by engaging others who are central to the problem or its potential solutions. The specific intervention selected will emerge over time as partners

Table 1 Distinct features of P&E interventions and recommended dissemination strategies

Distinct features of P&E	Recommended dissemination strategies
Evidence is emerging	1. Identify the best available research evidence • Evidence in support of effectiveness includes the following: - Evidence of changes to environments - Findings from expert consensus - Findings from natural experiments • Regularly update disseminated EBIs to remain current with latest evidence • Build practitioners' skills to evaluate their interventions' impact
Interventions are complex and evolving	2. Prioritize EBI recommendations over EBI programs • Consolidate existing lists of EBI strategies • Disseminate consolidated strategies as a menu of options 3. Incorporate stories from the field • Disseminate the lessons practitioners have learned • Disseminate materials and tools that practitioners have developed 4. Provide guidance on how to implement each strategy • Disseminate alternative approaches to implementing each strategy • Disseminate illustrations of each strategy in action and links to additional resources and tools.
Vested interests may resist change Interventions may have high start-up costs Interventions require different skill sets	5. Provide tools, training, and other resources to support the overall P&E intervention process • Disseminate tools to collect assessment and evaluation data • Disseminate promotional materials and other resources to raise awareness and engage partners • Provide training to build practitioners' competency to plan, implement, and evaluate P&E interventions 6. Integrate dissemination into practitioners' existing professional and social networks.

collaboratively prioritize approaches. They might begin by working in retail settings because it aligns with partners' priorities and retailers are willing to participate. New federal- and state-level funding streams are among many factors that may determine the next approach that is adopted. As shown in this illustration, although EBIs are essential, they are just one element in P&E intervention planning; practitioners also need to incorporate an evolving configuration of system components, with attention to multiple levels of influence and to stakeholder priorities and resources.

Vested Interests May Resist P&E Interventions With individual-level interventions, those affected typically have the opportunity to decide whether they will participate or not, as in the case of smoking cessation or weight management interventions. P&E interventions, on the other hand, often affect people and organizations that never agreed to participate and may actively resist the change. Resistance may come from individuals, such as employees who resist new organizational policies prohibiting smoking at the worksite. Resistance may also come from manufacturers with vested interests, such as the beverage industry's resistance to New York City's regulations on the size of sugar-sweetened beverages [38]. To respond to resistance, practitioners may need to incorporate marketing and advocacy efforts into their intervention plan. They may also need to consider a variety of approaches to intervening so they might negotiate and compromise with potential resisters to design a "win-win" approach [39].

For example, an extensive evidence base supports the effectiveness of raising the cigarette excise tax at the state level to increase the price of tobacco products and thereby reduce tobacco use [40]. Given potential policymaker resistance to new taxes and industry concerns about lost profits, practitioners may end up negotiating for alternative, nontax approaches to raising prices, such as cigarette minimum price laws or bans on coupon redemptions and other price promotions [41].

Some P&E Interventions Have High Start-Up Costs Although, over the long-term P&E interventions often have lower per person costs than individual-level interventions, they may require substantially more resources to get started. A weight management intervention may incur modest initial costs for staff time to plan and implement the intervention and then incur greater costs over time as providers assess, counsel, treat, and refer participants [42]. In contrast, publicly financing grocery store development in underserved areas requires extensive initial investment [43]. Although initial outlays are high, once built, the grocery stores should be self-sustaining and have broad and long lasting impact. Even when P&E interventions have relatively low implementation costs, as in the case of new zoning regulations for tobacco retailers, substantial investments may initially be required to promote their initial enactment and counter industry resistance.

P&E Interventions Require Distinct Skill Sets As practitioners engage in more upstream interventions, they have to learn to

work with nontraditional partners, such as retailers or farmers, and to navigate interrelationships among local, regional, and state policies. They also need new tools and to learn new methods to engage stakeholders, counter resistance, assess environments, and analyze policy among others [5].

Strategies for Disseminating Policy and Environmental EBIs

Both Center TRT and Counter Tobacco conduct formative research with their target audiences and customize offerings to address practitioner-reported needs and preferences. Center TRT's formative work has included input from an advisory board, focus groups, surveys, and key informant interviews [6, 44]. Counter Tobacco's formative research includes conversations with practitioners at national and regional meetings and input from an advisory group of academic and practitioner experts. Based on this formative work, Center TRT and Counter Tobacco have developed six strategies for P&E dissemination, which are summarized in Table 1 and described as follows:

1. Identify the best available evidence. Tobacco use, physical inactivity, and unhealthy dietary intake are high priority problems that require interventions targeting multiple risk factors, across multiple levels, and in a range of settings [45]. The evidence base for the range of interventions needed to change population-level health behaviors is still emerging. In response to this challenge, Center TRT and Counter Tobacco both focus on identifying and disseminating "the best available evidence [46]." In addition to evidence from research studies, both projects include evidence from expert consensus on interventions with high likelihood of being effective based on theory, parallel evidence, or evidence from natural experiments [47]. In addition, both projects define evidence of effectiveness to include evidence of improvements in environments even in the absence of evidence of changes in behaviors—if those environmental changes have a strong, plausible causal link to changes in behaviors. Both sites regularly revise recommended EBIs to remain current with the latest science.

To counterbalance the emergent nature of the evidence base, both projects build practitioners' capacity to evaluate their interventions' impact on environments. Practitioners' evaluation of their interventions is essential to assessing their effectiveness and to strengthening and sustaining interventions over time [48, 49].

2. Prioritize intervention strategies over programs. Organizations may disseminate EBIs in the formats of either *programs* or *strategies* [50]. Organizations that disseminate intervention *programs* typically identify "model programs" that have been demonstrated to be effective in one or more reasonably well-designed research studies and then disseminate them in a standardized format that practitioners might apply to replicate the EBI in their practice setting [6, 7, 51]. The intent of this approach is to provide a recipe that practitioners can follow, and programs typically include detailed guidance and materials to support implementation. Although practitioners may adapt programs to fit their contexts, emphasis is placed on maintaining fidelity to the recipe.

Another option is for organizations to disseminate intervention strategies, which are broad recommendations identified through expert consensus and systematic reviews of the literature. For example, based on a systematic review of the literature, the Community Guide recommends changing public policies at the federal, state, or local level to increase tobacco products' purchase price and thereby reduce tobacco use [40, 52]. When strategies are based on the findings of multiple studies, they often provide evidence for effectiveness across multiple settings and populations [50]. They do not, however, provide detailed guidance on how to implement them in practice. In other words, expert panels may tell you that raising cigarette excise taxes will reduce youth and adult smoking rates; however, the panel does not tell the practitioner the most effective way to convince policymakers to raise cigarette excise taxes.

Both Center TRT and Counter Tobacco prioritize intervention strategies because they provide practitioners with greater flexibility than do the more prescriptive approaches offered by programs [50, 53], thereby allowing practitioners to integrate interventions with ongoing activities and to craft and evolve an action plan that leverages existing resources and accommodates the needs and priorities of collaborating stakeholders [54]. They also allow for greater flexibility for negotiation and compromise with those who may resist the proposed P&E change [39]. In other words, strategies are consistent with a self-organizing rather than vertically controlled approach to change. Allowing the actors in a complex organization to self-organize increasingly is recognized as important to creating sustainable change in complex systems [54, 55].

In response to practitioners' experience of information overload [6], Center TRT integrated prominent obesity prevention guidance documents [8, 37, 56–58] to create a consolidated list of 26 intervention strategies that includes, for example, food and beverage marketing to favor healthy foods and beverages and urban design policy and zoning to facilitate physical activity [37]. Similar to Center TRT, Counter Tobacco reviewed existing literature and consolidated recommended strategies into a list of six general "policy solutions" [8, 40, 52, 59–64] that include (1) licensing and zoning to

impact the density, type, and location of tobacco retailers, (2) restricting POS tobacco advertising and promotions, (3) restricting product availability, placement, and packaging, (4) implementing POS graphic health warnings, (5) raising prices through nontax approaches, and (6) implementing the 2009 Family Smoking Prevention and Tobacco Control Act provisions affecting point-of-sale.

3. Provide guidance on how to implement strategies. Because strategies typically provide little information on implementation, both Center TRT and Counter Tobacco disseminate their strategies in a template that provides additional implementation guidance. Design of templates was informed by evidence from implementation science regarding the information practitioners need to select, adapt, and implement EBIs [44, 65–67]. Templates include information on the EBI's potential to reach the intended population and be adopted and implemented widely, as well as guidance and on how to adapt and implement the EBIs in real world settings. Although the guidance provided is less prescriptive than what is possible with intervention programs, the templates provide an overview of the strategy, illustrations of how it might be used in practice, and links to additional resources and tools. The template also provides citations to publications providing evidence in support of its effectiveness (see Figs. 1 and 2 for illustrations of the two projects' templates).

Formatting intervention strategies into a consistent template facilitates practitioners' efforts to locate the information they need to compare and select strategies as well as the

Fig. 1 Screen capture of Center TRT intervention strategy template

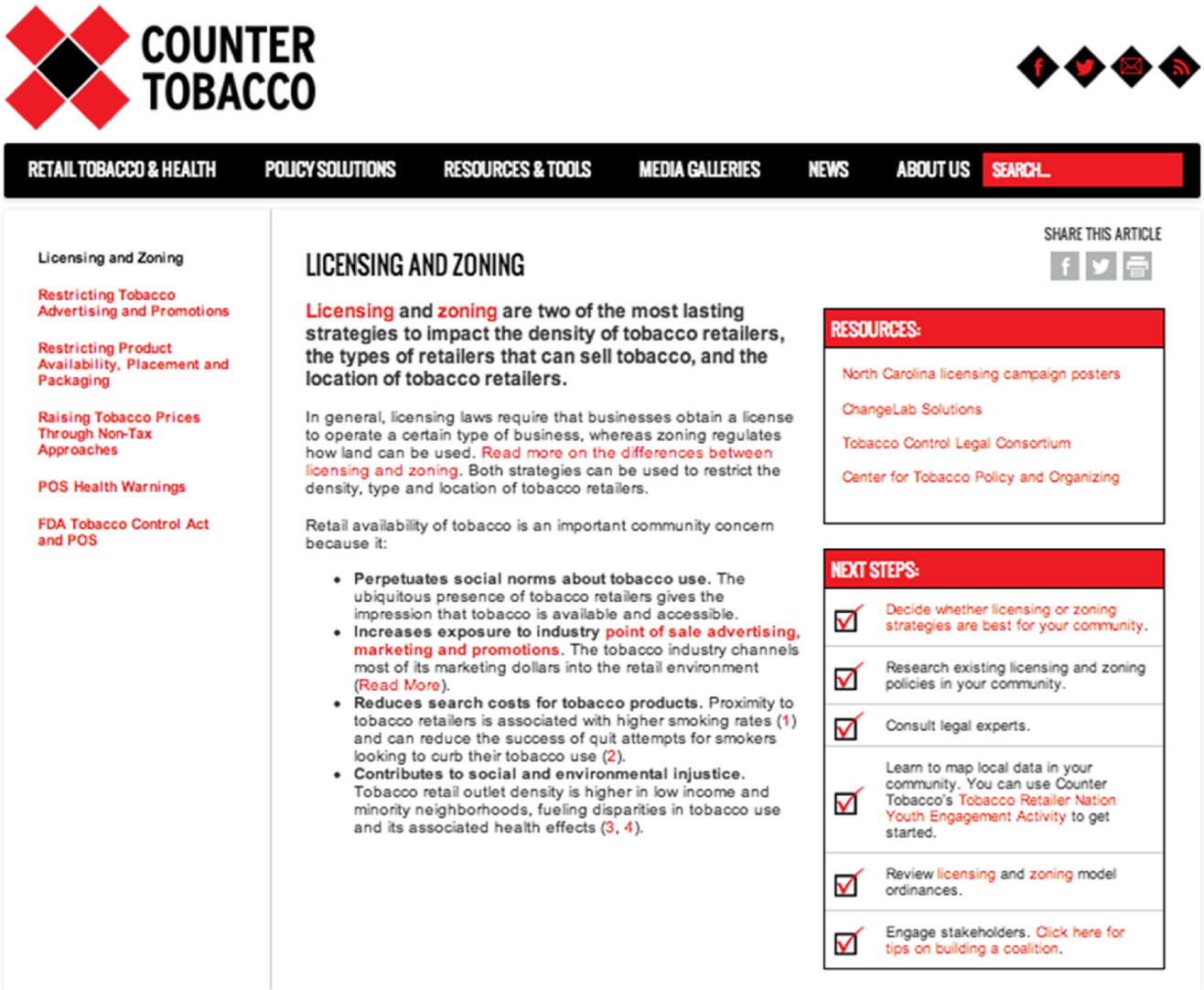

Fig. 2 Partial screen capture of Counter Tobacco Licensing and Zoning policy solution template

guidance they need to implement changes in policies and environments. For example, in response to growing interest in banning tobacco sales at pharmacies, Counter Tobacco staff interviewed practitioners in California and Massachusetts to develop the Tobacco-Free Pharmacies Action Guide that describes a four-part process for implementing these policies (see: http://countertobacco.org/tobacco-free-pharmacies).

4. Incorporate stories from the field. To provide practitioners with additional implementation guidance, both Center TRT and Counter Tobacco capture and disseminate stories and materials from the field. Much of the innovative P&E intervention work is occurring in practice as practitioners innovate new and better ways to implement recommended EBI strategies [45]. The findings from these practitioner-developed interventions contribute guidance for other practitioners on how they might implement EBI strategies in practice [44, 67].

Center TRT captures and disseminates detailed descriptions of practitioner-developed interventions that employed one or more of its list of 26 intervention strategies. As of December 2013, the Center TRT website was disseminating detailed information about 33 interventions. For example, Center TRT disseminates information about West Virginia's implementation of statewide standards for foods and beverages in its public schools, a P&E intervention that employs the strategy "increasing the availability of healthier foods and beverages [37]." The intervention description includes details on the steps practitioners took to promote, implement, and evaluate the policy and highlights the barriers they encountered and keys to their success. The description also includes links to the enacted policy and nutrition standards, outreach and marketing materials, and evaluation tools.

Counter Tobacco incorporates stories from the field within its intervention strategy templates. For example, Counter Tobacco's template on graphic POS health warnings provides

stories from New York City's attempt to enact mandatory warnings and includes text for the proposed ordinance and a link to the Center for Public Health & Policy's updates on the City's ongoing legal battle. The template also details Jefferson County Alabama's implementation of voluntary POS health warnings and provides links to graphics of the county's signage, rationale for their design, and findings from an initial pilot of the voluntary approach to POS warnings.

5. Build practitioners' capacity to plan, implement, and evaluate P&E interventions. In addition to providing implementation guidance and tools for specific interventions, Center TRT and Counter Tobacco provide training, tools, and other resources to build practitioner's' overall capacity to plan, implement, and evaluate P&E interventions.

Center TRT assesses practitioners' perceptions of their competency to plan and implement P&E interventions and then designs online and in-person trainings to address areas identified as high need [68]. Areas rated as highest need, and addressed in recent trainings, included engaging in the policy-making process, raising awareness via mass media, and evaluating intervention processes and outcomes. Center TRT has also developed several tools, most notably a framework and other resources that practitioners might use to evaluate all phases of the P&E intervention process [69]. They also have adapted a tool that practitioners can use to assess and strengthen an intervention's potential for long-term sustainability [70].

The Counter Tobacco website includes an archive of a dozen 90-min CDC POS training webinars covering legal issues and youth engagement among other topics. Counter Tobacco also provides a range of resources that practitioners' can use to raise awareness of the POS problem, engage partners, overcome resistance, and educate for change. The website disseminates an issue brief entitled "About the War in the Store" that summarizes the problem at POS and two slide shows on the evidence in support of POS interventions with written narration that practitioners might adapt for presentations to potential stakeholders. The site also features pre-packaged youth and community engagement activities (see Fig. 3) and data collection tools such as store observation forms and public opinion poll templates. These tools can be used to assess the extent to which retailer's marketing or products are designed to appeal to youth and their compliance with regulations. Counter Tobacco also is partnering with the National Cancer Institute's State and Community Tobacco Control initiative (http://www.sctcresearch.org/) to develop the forthcoming Standardized Tobacco Assessment for Retail Settings (STAR S) tool.

Counter Tobacco is also home to galleries of store images, maps, videos, and print campaigns that practitioners can use to make the case for the POS problem. The store image and map gallery contains hundreds of images, most crowdsourced from practitioners. Images capture prominent displays of tobacco products and marketing at stores such as photos of cigarette advertising directly adjacent to candy or other products with youth appeal. Maps are created using geographic information systems (GIS) to convey strong relationships between greater retailer density and key demographic variables by census tract, such as percentage of households in poverty. These images and maps are used by local practitioners to engage their coalitions and policymakers, and some have already been featured in reports and news stories on POS issues. Videos summarizing the POS problem and solutions are produced by Counter Tobacco and also crowdsourced from practitioners and youth coalitions.

6. Integrate dissemination into practitioners' interpersonal professional and social networks. Close to half a century of research on the diffusion of innovations has established the importance of interpersonal relationships to promoting practitioners' use of interventions [70]. Through its formative work, the Center TRT learned that its target audience's most valued sources for information include CDC project officers, other CDC resources, and their peers [6].

Fig. 3 Pre-packaged community and youth engagement activities (CounterTobacco.org)

Therefore, every time the Center adds a new intervention to its website, a staff posts a notice on the listserv that the CDC uses to communicate with obesity-prevention practitioners. To foster peer-to-peer networking and communication, the Center convenes members of its target audience for an annual 5-day obesity prevention course. In addition, both Center TRT and Counter Tobacco introduce their resources via webinars and at the national conferences practitioners attend. Counter Tobacco participates in monthly CDC-hosted calls with national tobacco control partners and announces new tools and resources to tobacco-control professionals via direct meetings with CDC project officers and listservs. To develop interpersonal relationships and build brand awareness, Counter Tobacco also uses two social media channels, Facebook (http://www.facebook.com/CounterTobacco) and Twitter (https://twitter.com/CounterTobacco). Social media campaigns include photo contests, news of media coverage of policy debates or implementation, quick research summaries, and shares of content posted by partner tobacco control organizations.

Findings from the Centers' Preliminary Process Evaluations

Methods Both Centers have evaluated practitioners' use and perceptions of website resources. Data collection methods have included the use of website analytics and online surveys; Center TRT surveyed all state-level public health practitioners working in CDC-funded obesity prevention programs and Counter Tobacco surveyed a convenience sample of site users. Both Centers' process evaluations were approved by the UNC Institutional Review Board.

Center TRT Results In 2012, over 26,000 unique visitors accessed the Center TRT website (www.centertrt.org) and downloaded over 12,400 documents. Center TRT's survey methods are reported elsewhere [6]. Here we report previously unreported findings related to practitioners' awareness, use, and perceptions of Center TRT resources. Sixty-three practitioners (50 % response rate) representing 42 state health departments completed the survey. Participants included 36 program managers, 19 physical activity or nutrition coordinators, and 8 others, most of whom had a master's degree (69.8 %). The majority of respondents had heard of the Center TRT website (n=54, 87.3 %) and of those who had heard of the website, nearly all had visited it (94.5 %). Over half of respondents who had heard of the website (53.8 %) had visited it four or more times over the past 12 months and 79.6 % had downloaded one or more documents. The majority of participants who had heard of the Center TRT website agreed that materials were easy to download (73.6 %) and easy to use (71.7 %).

Counter Tobacco Results The Counter Tobacco website (www.countertobacco.org) has had over 17,000 unique visitors from all 50 states since its launch in August 2011. Twenty-two site users responded to the survey, which was made available via the Counter Tobacco Newsletter, as a pop-up on CounterTobacco.org, and on the CounterTobacco.org Facebook page and Twitter feed. The majority of respondents held a Bachelor's (45 %) or Master's (45 %) degree, and worked in a nonprofit/community-based organization (32 %) or an academic setting (27 %). All respondents found the site to be user-friendly (71 %) or somewhat user-friendly (29 %) and found it easy (59 %) or somewhat easy (41 %) to find what they are looking for on CounterTobacco.org. Over 75 % of survey respondents recommended the site to a friend or a colleague, indicating they trust the site as a source of information.

Conclusion

Practitioners more readily adopt and implement EBIs when they address practitioners' needs and aspirations [53, 71], are integrated within their social and professional contexts [65, 72], and include comprehensive implementation guidance [73]. To be effective, practitioners need to have the flexibility to develop P&E interventions that integrate stakeholder priorities and resources and accommodate existing local policies and environments. To support practitioners as they engage in this work, Center TRT and Counter Tobacco disseminate evidence in the format of broad, flexible recommendations of the most effective intervention strategies and then link those recommendations to implementation guidance and materials. Both programs also have developed tools and trainings to strengthen practitioners' capacity to engage in the overall process of planning and implementing P&E interventions. The evidence base for P&E interventions is emerging rapidly and much of the new knowledge is being generated in practice. To capture these new findings, both programs facilitate peer-to-peer interactions and disseminate lessons from practice.

The decision to focus on disseminating intervention strategies versus more prescriptive intervention programs has limitations. In the absence of a recipe, practitioners have less guidance to implement the intervention with fidelity to the approach that was effective in prior research studies and, therefore, may have less potential to be effective in practice. However, several surveys suggest that practitioners are making only limited use of EBI programs in practice [74, 75]. Furthermore, a growing number of scholars are questioning

the utility and relevance of EBI programs for complex systems change [51, 55].

The decision to disseminate the best *available* as opposed to best *possible* evidence might also be viewed as a limitation. Research on P&E interventions may not be amenable to the research methods generally viewed as the gold standard for determining effectiveness. Documenting effectiveness is challenged by the length of time required for interventions to affect health outcomes, the frequent co-occurrence of multiple interventions [45], and the limited applicability of controlled trials study designs [1]. Both Centers respond to the emergent nature of the evidence on P&E interventions by updating their EBIs to remain current with the latest science and by building practitioners' capacity to evaluate the effectiveness of their interventions, with a particular focus on assessing their impact on environments.

Findings from the Centers' preliminary process evaluations indicate that both are successful at reaching their intended practitioner audiences with resources that they value. Research is now needed to assess how practitioners are using the disseminated recommendations, guidance, and tools in practice and the impact that they are having on policies and environments.

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References

1. Brennan L, Castro S, Brownson RC, Claus J, Orleans CT. Accelerating evidence reviews and broadening evidence standards to identify effective, promising, and emerging policy and environmental strategies for childhood obesity prevention. Annu Rev Public Health. 2011;32:199–223.
2. Frieden TR. A framework for public health action: the health impact pyramid. Am J Public Health. 2010;100(4):590–5.
3. Brownson RC, Haire-Joshu D, Luke DA. Shaping the context of health: a review of environmental and policy approaches in the prevention of chronic diseases. Annu Rev Public Health. 2006;27:341–70.
4. Institute of Medicine. Accelerating progress in obesity prevention: solving the weight of the nation. Washington, D.C.: National Academies Press; 2012.
5. Gantner LA, Olson CM. Evaluation of public health professionals' capacity to implement environmental changes supportive of healthy weight. Eval Program Plann. 2012;35(3):407–16.
6. Leeman J, Teal R, Jernigan J, Reed JH, Farris R, Ammerman A. What evidence and support do state-level public health practitioners need to address obesity prevention. Am J Health Promot. 2014;28:189–96.
7. Armstrong R, Waters E, Crockett B, Keleher H. The nature of evidence resources and knowledge translation for health promotion practitioners. Health Promot Int. 2007;22(3):254–60.
8. The Community Preventive Services Task Force. Guide to community preventive services (The Community Guide). CDC. 2013. http://www.thecommunityguide.org/index.html.Accessed 3 Feb 2014.
9. Public Health Law Center. 2014. http://publichealthlawcenter.org/. Accessed 3 Feb 2014.
10. Health Evidence. 2014 at healthevidence.org. Accessed 3 Feb 2014.
11. Evidence for Practice and Policy Information. Centre at Social Science Research Unit, Institute of Education, University of London, UK. http://eppi.ioe.ac.uk/cms/. Accessed 3 Feb 2014.
12. Tseng V, Cadigan K, Eason JQ, Huston AC. The uses of research in policy and practice. Soc Policy Rep. 2012;26:3–23.
13. National Cancer Institute, National Institutes of Health. Research Tested Intervention Programs. http://rtips.cancer.gov/rtips/index.do. 2013. Accessed 20 June 2013.
14. Substance Abuse and Mental Health Services Administration. National Registry of Evidence-based Programs and Practices 2014. http://nrepp.samhsa.gov/. Accessed 7 Jan 2014.
15. Committee on the Use of Social Science Knowledge in Public Policy. Using science as evidence in public policy 2012. National Academy of Science.
16. Lich KH, Ginexi EM, Osgood ND, Mabry PL. A call to address complexity in prevention science research. Prev Sci. 2013;14:279–89.
17. Lyn R, Aytur S, Davis T, et al. Policy, systems, and environmental approaches for obesity prevention: a framework to inform local and state action. JPHMP. 2013;19:S23–33.
18. National Cancer Institute. Research Tested Intervention Programs. Youth Fit For Life. http://rtips.cancer.gov/rtips/programDetails.do?programId=293932. Retrieved 7 Jan 2014.
19. National Complete Streets Coalition. Complete streets local policy workbook. Smart Growth America. 2012. http://www.smartgrowthamerica.org/documents/cs-local-policy-workbook.pdf. Retrieved 7 Jan 2014.
20. Henriksen L, Schleicher NC, Feighery EC, Fortmann SP. A longitudinal study of exposure to retail cigarette advertising and smoking initiation. Pediatrics. 2010;126(2):232–8.
21. Slater SJ, Chaloupka FJ, Wakefield M, Johnston LD, O'Malley PM. The impact of retail cigarette marketing practices on youth smoking uptake. Arch Pediatr Adolesc Med. 2007;161:440–5.
22. Reitzel LR, Cromley EK, Li Y, Cao Y, Dela Mater R, Mazas CA, et al. The effect of tobacco outlet density and proximity on smoking cessation. Am J Public Health. 2011;101:315–20.
23. Carter BL, Robinson JD, Lam CY, Wetter DW, Tsan JY, Day SX, et al. A psychometric evaluation of cigarette stimuli used in a cue reactivity study. Nicotine Tob Res. 2006;8:361–9.
24. Wakefield M, Germain D, Henriksen L. The effect of retail cigarette pack displays on impulse purchase. Addiction. 2008;103:322–8.
25. Swinburn B, Sacks G, Hall KD, McPherson K, Finegood DT, Moodie ML, et al. The global obesity pandemic: shaped by global drivers and local environments. Lancet. 2011;378:804–14.

26. Gortmaker SL, Swinburn BA, Levy D, Carter R, Mabry PL, Finegood DT, et al. Changing the future of obesity: science, policy, and action. Lancet. 2011;378:838–47.
27. Farley TA, Van Wye G. Reversing the obesity epidemic: the importance of policy and policy research. Am J Prev Med. 2012;43:S93–4.
28. Institute for Global Tobacco Control. State of evidence review: point of sale promotion of tobacco products. Johns Hopkins Bloomberg School of Public Health. 2013. http://www.jhsph.edu/research/centers-and-institutes/institute-for-global-tobacco-control/resources_publications/reports_and_guides/2013/2013POS_soe.pdf. Retrieved 3 Feb 2014.
29. Hammond RA. Complex systems modeling for obesity research. Prev Chron Dis. 2009;6(3):A97.
30. Sterman JD. Learning from evidence in a complex world. Am J Public Health. 2006;96:505–14.
31. Van Koperen TM, Jebb SA, Summerbell CD, Visscher TL, Romon M, Borys JM, et al. Characterizing the EPODE logic model: unravelling the past and informing the future. Obes Rev. 2013;14:162–70.
32. Peterson JC, Rogers EM, Cunningham-Sabo L, Davis SM. A framework for research utilization applied to seven case studies. Am J Prev Med. 2007;33:S21–34.
33. Dreisinger ML, Boland EM, Filler CD, Baker EA, Hessel AS, Brownson RC. Contextual factors influencing readiness for dissemination of obesity prevention programs and policies. Health Educ Res. 2012;27:292–306.
34. Luke DA, Stamatakis KA. Systems science methods in public health: dynamics, networks, and agents. Annu Rev Public Health. 2012;33:357–76.
35. Hawe P, Shiell A, Riley T. Theorising interventions as events in systems. Am J Community Psychol. 2009;43(3–4):267–76.
36. Ogilvie D, Cummins S, Petticrew M, White M, Jones A, Wheeler K. Assessing the evaluability of complex public health interventions: five questions for researchers, funders, and policymakers. Milbank Q. 2011;89:206–25.
37. Khan LK, Sobush K, Keener D, Goodman K, Lowry A, Kakietek J, et al. Recommended community strategies and measurements to prevent obesity in the United States. MMWR Recomm Rep. 2009;58:1–26.
38. Confessore N, Bennet, K. Minority groups and bottlers team up in battles over soda. New York Times. 2013 March 12. http://www.nytimes.com/2013/03/13/nyregion/behind-soda-industrys-win-a-phalanx-of-sponsored-minority-groups.html?pagewanted=all. Retrieved 3 Feb 2014.
39. Work Group for Community Health and Development. Influencing Policy Development. The Community Tool Box. 2013. http://ctb.ku.edu/en/dothework/tools_tk_content_page_250.aspx. Retrieved 3 Feb 2014.
40. Bonnie RJ, Stratton K, Wallace RB, editors. Committee on reducing tobacco use: strategies, barriers, and consequences, institute of medicine. Ending the tobacco problem: a blueprint for the nation. Washington, DC: National Academies Press; 2007.
41. Ribisl KM, Rogers T, Mahoney M. Assessing alternative tobacco price policy options. CPPW Annual Training. 2011. http://countertobacco.org/sites/default/files/Asessing%20Alternative%20Tobacco%20Price%20Policy%20Options%20-%20CPPW%20Annual%20Training%202011 %20-%20Ribisl%2C%20Rogers%20Mahoney.pdf. Retrieved 3 Feb 2014.
42. Hollinghurst S, Hunt LP, Banks J, Sharp DJ, Shield JP. Cost and effectiveness of treatment options for childhood obesity. Pediatr Obes 2013.
43. Giang T, Karpyn A, Laurison HB, Hillier A, Perry RD. Closing the grocery gap in underserved communities: the creation of the Pennsylvania Fresh Food Financing Initiative. JPHMP. 2008;14:272–9.
44. Leeman J, Sommers J, Leung MM, Ammerman A. Disseminating evidence from research and practice: a model for selecting evidence to guide obesity prevention. JPHMP. 2011;17:133–40.
45. Kumanyika SK, Parker L, Sim LJ, editors. Committee on an evidence framework for obesity prevention decision making; institute of medicine. Bridging the evidence gap in obesity prevention: a framework to inform decision making. Washington, D.C.: The National Academies Press; 2010.
46. Koplan JP, Liverman CT, Kraak VI, editors. Committee on prevention of obesity in children and youth, institute of medicine. Preventing childhood obesity: health in the balance. Washington, DC: National Academies Press; 2005.
47. Swinburn B, Gill T, Kumanyika S. Obesity prevention: a proposed framework for translating evidence into action. Obes Rev. 2005;6:23–33.
48. Glasgow RE, Green LW, Taylor MV, Stange KC. An evidence integration triangle for aligning science with policy and practice. Am J Prev Med. 2012;42:646–54.
49. Haby MM, Vos T, Carter R, Moodie M, Markwick A, Magnus A, et al. A new approach to assessing the health benefit from obesity interventions in children and adolescents: the assessing cost-effectiveness in obesity project. Int J Obes (Lond) . 2006;30:1463–75.
50. Lipsey MW. The challenges of interpreting research for use by practitioners: comments on the latest products from the Task Force on Community Preventive Services. Am J Prev Med. 2005;28:1–3.
51. Greig G, Entwistle VA, Beech N. Addressing complex healthcare problems in diverse settings: insights from activity theory. Soc Sci Med. 2012;74:305–12.
52. U.S. Department of Health and Human Services. Preventing Tobacco Use Among Youth and Young Adults: A report of the surgeon general. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2012.
53. Grimshaw JM, Eccles MP, Lavis JN, Hill SJ, Squires JE. Knowledge translation of research findings. Implement Sci. 2012;7:50.
54. Snowden DJ, Boone ME. A leader's framework for decision making. Harv Bus Rev. 2007;85:68–76,149.
55. Lanham HJ, Leykum LK, Taylor BS, McCannon CJ, Lindberg C, Lester RT. How complexity science can inform scale-up and spread in health care: Understanding the role of self-organization in variation across local contexts. Soc Sci Med 2012.
56. Committee on Obesity Prevention Policies for Young Children, Institute of Medicine. Early childhood obesity prevention policies. Washington, D.C.: The National Academies Press; 2011.
57. Committee on Childhood Obesity Prevention Actions for Local Governments, Food and Nutrition Board, Board on Children, Youth, and Families, Board on Population Health and Public Health Practice, Transportation Research Board, Institute of Medicine. Local government actions to prevent childhood obesity. Washington, D.C.: The National Academies Press; 2009.
58. Lee V, Mikkelsen L, Srikantharajah J, Cohen L. Promising strategies for creating healthy eating and active living environments. Convergence Partnership. 2008. http://www.preventioninstitute.org/component/jlibrary/article/id-59/127.html. Retrieved 3 Feb 2014.
59. Paynter J, Edwards R. The impact of tobacco promotion at the point of sale: a systematic review. Nicotine Tob Res. 2009;11:25–35.
60. U.S. Department of Health and Human Services. Reducing tobacco use: a report of the surgeon general. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2000.
61. National Cancer Institute. The role of the media in promoting and reducing tobacco use. Tobacco Control Monograph No. 19.

Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute. NIH Pub. No. 07-6242 , 2008.
62. Tobacco Control Legal Consortium. Restricting tobacco advertising. 2011. http://publichealthlawcenter.org/sites/default/files/resources/tclc-guide-restricttobadvert-2011.pdf. Retrieved 3 Feb 2014.
63. Tobacco Control Legal Consortium. Location, location, location: regulating tobacco retailer locations for public health. 2012. http://publichealthlawcenter.org/sites/default/files/resources/tclc-guide-regulating-retailer-locations-2012.pdf. Retrieved 3 Feb 2014.
64. The Centre for Tobacco Control Research, University of Stirling and The Open University. Point of sale display of tobacco products. Cancer Research UK. 2008. http://www.cancerresearchuk.org/prod_consump/groups/cr_common/@nre/@pol/documents/generalcontent/crukmig_1000ast-3338.pdf. Retrieved 3 Feb 2014.
65. Glasgow RE. HMC research translation: speculations about making it real and going to scale. Am J Health Behav. 2010;34:833–40.
66. Rogers EM. Diffusion of innovations. New York: Free Press; 2003. p. 68–9.
67. Brouwers MC, Makarski J, Garcia K, Bouseh S, Hafid T. Improving cancer control in Canada one case at a time: the "Knowledge Translation in Cancer" casebook. Curr Oncol. 2011;18(2):76–83.
68. Mainor A, Leeman J, Sommers J, Heiser C, Gonzales C, Farris R, Ammerman A. A systematic approach to planning and evaluating public health training: the Obesity Prevention in Public Health Course. JPHMP 2014.
69. Leeman J, Sommers J, Vu M, Jernigan J, Payne G, Thompson D, et al. An evaluation framework for obesity prevention policy interventions. Prev Chron Dis. 2012;9:E120.
70. Schell SF, Luke DA, Schooley MW, Elliott MB, Herbers SH, Mueller NB, et al. Public health program capacity for sustainability: a new framework. Implement Sci. 2013;8:15.
71. Maibach EW, Van Duyn MS, Bloodgood B. A marketing perspective on disseminating evidence-based approaches to disease prevention and health promotion. Prev Chron Dis. 2006;3:A97.
72. Dearing JW, Kreuter MW. Designing for diffusion: how can we increase uptake of cancer communication innovations? Patient Educ Couns. 2010;81(Suppl):S100–10.
73. Kreuter MW, Bernhardt JM. Reframing the dissemination challenge: a marketing and distribution perspective. Am J Public Health. 2009;99:2123–7.
74. Hannon PA, Fernandez ME, Williams RS, Mullen PD, Escoffery C, Kreuter MW, et al. Cancer control planners' perceptions and use of evidence-based programs. J Public Health Manag Pract. 2010;16:E1–8.
75. Escoffery CT, Kegler MC, Glanz K, Graham TD, Blake SC, Shapiro JA, et al. Recruitment for the national breast and cervical cancer early detection program. Am J Prev Med. 2012;42:235–41.