

Need for Innovation in Public Health Research

The recent conference *Turning the Tide: A New Generation of Public Health Interventions* highlighted the need to utilize innovative and emergent methodologies to confront increasingly complex public health challenges.

In this commentary, we discuss three dominant themes from the conference: addressing multiple levels of causality in reducing health problems; technology-based methodologies to enhance health promotion; and improving translation and sustainment of effective health promotion programs. The subsequent articles, included in this supplement issue of *AJPH*, provide compelling examples and arguments supporting these progressive approaches to public health promotion.

We recommend that public health researchers draw inspiration from these examples and embrace interdisciplinary, innovative methods within their future work. (*Am J Public Health*. 2019; 109:S117–S120. doi:10.2105/AJPH.2018.304876)

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Public health promotion has become a cornerstone of efforts designed to prevent and reduce morbidity and mortality across the globe.¹ Many nations have embraced public health promotion as an important strategy for modifying health risk behaviors and reducing the population-level burden of both noncommunicable diseases and infectious diseases.² In the United States, as well as globally, public health promotion has been a fundamental approach—indeed, has been instrumental in redressing social injustice and health inequities. However, for public health promotion to achieve its promise and be optimally impactful, innovative and rigorous research methodologies must be incorporated.

Acknowledging the critical role of research methodologies in public health promotion, the recent conference *Turning the Tide: A New Generation of Public Health Interventions* highlighted the need to utilize innovative and emergent methodologies to confront increasingly complex public health challenges. The complexity of these public health challenges is rooted in the diversity of determinants—biological, social, environmental, personal, organizational, societal, and economic—that directly and indirectly affect health and health behavior (both risky and health promoting) and, subsequently, the likelihood and trajectory of adverse health conditions. The scope of these public health challenges is perhaps best captured by a socio-ecological

framework, which acknowledges the importance of an interlocking array of diverse sources of influences, risk factors, and determinants across multiple levels. As amply noted at the conference, addressing these emergent challenges will require a trans-disciplinary science approach.

The success of public health promotion is, to a large extent, attributable to the heterogeneity of disciplines actively involved in advancing the science of health promotion and public health more broadly. Innovations in public health promotion are being made by breaking down disciplinary silos and transcending disciplinary boundaries in theory, methodology, implementation, and evaluation strategies. Thus, the complexity of today's public health challenges illuminates the need to open our scientific arms and embrace new methodologies, technologies, theoretical frameworks, strategies, and approaches that represent transdisciplinary thinking. We must embark on a journey to develop new and innovative methodologies that are responsive to today's complex and evolving public health challenges.

The conference addressed myriad methodologies for

enhancing public health promotion (please see associated articles in this issue of *AJPH*), too numerous to recapitulate in this commentary. Instead, we describe and amplify some selective central themes that emerged from the conference.

ADDRESSING MULTIPLE LEVELS OF CAUSALITY

Historically, health behavior and health outcomes have been largely viewed as an individual-level phenomenon. This perspective dominated the early days of health promotion efforts. Subsequently, we have witnessed a subtle but continuing paradigmatic shift, from the conceptualization of health as a function solely of the individual to a broader emphasis on the individual within his or her social, economic, and environmental context. For example, current thinking conceptualizes adolescent health within an ecological framework that is broader in scope and more comprehensive, permitting more precisely targeted interventions at each relevant level. The ecological

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This article was accepted November 4, 2018.

doi: 10.2105/AJPH.2018.304876

framework provides a greater understanding of the influences that affect adolescents' risk and health, and it guides development of multifaceted solutions that systematically target different ecological levels, optimizing programmatic complementarity, efficiency, and effectiveness.

As researchers and practitioners alike increasingly acknowledge the importance of social context and social networks on health behavior and health outcomes, the need to understand behavior within social environments and intervene on these broader social structural levels becomes critical. Although individual-level interventions can be effective at motivating behavior change, they may not be sufficient to sustain behavior change over long periods of time, particularly in the face of pervasive countervailing social norms and pressures that promote or reinforce risk behavior. Likewise, the built environment greatly influences an individual's health behaviors and health outcomes. Physical spaces may provide access to certain resources or entail exposure to toxins and pollutants, or they may influence lifestyle decisions. Addressing behavior change at the individual level often lacks sufficient breadth to reach large segments of an at-risk population and often fails to reach those who are medically underserved or have fewer social and economic resources. Thus, for behavior change to be meaningful, it must be durable, and the social and contextual changes that support behavior change must be long-lasting. Broader, community- and population-level methodologies are critical as a catalyst for behavior change, but also as support for the adoption of newly acquired health-protective behaviors over protracted periods of time.

TECHNOLOGY-BASED METHODOLOGIES

One methodology in public health promotion research, which has garnered considerable traction in the field, is in the development of technology-based strategies. Technology-based strategies may be effective in enhancing health risk communication, preventing engagement in risk behaviors, motivating the adoption of health-protective behaviors, reinforcing health promotion messages, and sustaining newly adopted health-protective behaviors.

Technology encompasses a broad array of methodologies. Most often it is thought of as encompassing media, such as radio or television (Big Media); however, other technologies may be equally, if not more, appropriate for promoting effective health behavior change, such as computer-based interventions or Internet-implemented interventions (eHealth) or mobile technologies for texting behavior change messages or videos (mHealth) via smartphones or using biosensors as cues to promote behavior change. These newer technologies provide exciting opportunities to develop more precisely tailored interventions. As stand-alone interventions or in complementary models with other intervention strategies (i.e., small group or individual-level face-to-face counseling), these technology-based interventions may affect not only individuals but social networks as well, and foster a social climate that encourages continued adherence to health-protective behaviors.

Technology-based modalities—for example, the Internet and mobile devices—may leverage new or existing social

media platforms and can be useful in increasing awareness of health risks, highlighting the benefits of health promotion, and creating a social climate that encourages public or private support for health promotion. The Internet can effectively reach vulnerable populations and address socially sensitive issues. Thus, these technology-based strategies actually represent a variety of methodologies that can be harnessed in support of public health promotion and can be instrumental in creating a social climate that makes a wide spectrum of health promotion strategies more acceptable at the individual, organizational, and population level.

Although the diversity of technology-based methodologies is apparent and can be used to target different segments of the population or, more specifically, at-risk segments of the population, technology-based methodologies can also be partnered with other methodologies to encourage the adoption and motivate the sustainment of health-protective behavior over long periods of time. For example, there is ample evidence from health promotion research, across diverse fields, that both individual-level and community-level behavioral interventions can modify health risk behaviors. However, there are also empirical data describing waning intervention effects over time. Thus, newly adopted health-protective behaviors, acquired through participation in a public health promotion program, are prone to decay over time. That is, the more time that elapses following participation in an intervention, the greater the attenuation of effects (health-protective behavior begins to regress to the mean).

One strategy that is frequently utilized to minimize decay (or attenuation of treatment effects) in health promotion interventions is to use counselor- or health educator-delivered booster sessions subsequent to delivering the primary “dose” of the intervention. Although this strategy has shown efficacy in reconstituting treatment effects in long-term follow-up, it is labor- and time-intensive and thus costly and often financially prohibitive in our current fiscally constrained public health environment. Therefore, the identification of innovative and cost-effective methodological approaches that can promote the sustainment of newly acquired health-protective behaviors over long periods of time is critical.

One program we developed used low technology and an innovative research design and intervention to reduce and sustain adolescents' sexual risk behavior and sexually transmitted infections (STIs). In this study, our objective was to evaluate the efficacy of a brief telephone counseling prevention maintenance intervention (PMI) as an adjuvant to a group-based intervention in sustaining STI- and HIV-preventive behaviors and reducing incident STIs during a 36-month follow-up. Using an innovative two-arm randomized supplemental treatment (adjuvant) trial design,³ we recruited 701 African American adolescent girls aged 14 to 20 years, obtained their consent, and randomized them to receive a primary treatment and subsequently receive a different (supplemental or adjuvant) treatment (PMI) to enhance the long-term effects of the primary treatment. Participants in the experimental condition ($n = 342$) received an adapted evidence-based STI-HIV intervention and a PMI consisting

of brief telephone contacts every eight weeks over 36 months to reinforce and complement prevention messages. Comparison-condition participants ($n = 359$) received HORIZONS and a time- and dose-consistent PMI focused on general health.⁴ The findings supported the use of brief telephone-based counseling as an effective strategy to sustain and amplify health-protective behaviors over an extended follow-up period.

Mobile phone technology is widespread in the United States and in many global communities. According to the Pew Research Center, 95% of Americans now own some type of cellphone, 77% of Americans own smartphones, and 89% of American adults use the Internet.^{5,6} The proportion of people using mobile and Internet technology is expected to continue escalating. Still, access to these technologies is not guaranteed. For example, there is a digital divide between rural and nonrural Americans; reaching rural households may require greater emphasis on face-to-face, interpersonal, or community-based intervention strategies. Again, it is important to examine health behavior within a social-ecological framework to identify which intervention strategies are implementable, and which methodologies are applicable and appropriate for the population.

The Turning the Tide conference explored technology-based methodologies such as mobile data collection for place-based health research, automated text messaging programs, social media to disseminate health information, and high-performance computing to analyze large volumes of big data. For more in-depth descriptions of effective technology-based methodologies, the interested

reader is referred to articles in this volume of *AJPH* as well as to the work of other scholars in the field.⁷⁻⁹

IMPROVING TRANSLATION AND SUSTAINMENT

No health promotion intervention is perfect. It should be axiomatic that not every individual or community exposed to a behavioral intervention will adopt the specified health-protective behaviors. Such a goal is unrealistic and, more importantly, unnecessary to effectively alter the risk trajectory for health risk behaviors or adverse health outcomes on a population level. Striving for this goal may even be counterproductive, creating inertia among policy experts, practitioners, and other consumers of public health promotion research while they search for the “magic bullet” intervention. The pursuit of the perfect intervention should not be the enemy of the good intervention.

With the caveat that public health promotion programs need not be perfect to have a salubrious effect, it is worth noting that this does not mean that we lower the standard for determining effective public health promotion interventions. Quite to the contrary. Failure to adopt and maintain rigorous standards for identifying effective public health promotion interventions comes with the cost of wasting scarce resources on ineffective programs. It does mean, however, that although the continued efforts of scientists and practitioners need to be directed at developing more effective interventions—particularly for populations and settings for whom few exist—

rigorously designed, implemented, and evaluated interventions that have already demonstrated programmatic efficacy need to be widely disseminated, adopted, implemented, and scaled up to have optimal impact at a population level. Ultimately, enhancing public health depends not only on the discovery or development of innovative behavior change methodologies, but also on how efficiently and effectively these methodologies can be translated, integrated, and sustained in clinic practice, school curricula, community settings, and other real-world contexts. Thus, one emphasis of the conference focused on identifying mechanisms for the timely and widespread translation of effective interventions outside of our well-resourced academic settings and into diverse community-, clinical-, or school-based settings.

The research output identifying effective, theory-based public health promotion programs has been remarkable. Conversely, the uptake, integration, and sustainability of these demonstrably effective programs have been far less satisfactory. The reasons for the gap between “what we know” based on science and “what we do” in practice are complex and multifaceted. However, they relate, in part, to the fact that, historically, researchers have not designed interventions with dissemination, implementation, and scalability in mind and, until recently, attention has focused predominantly on internal validity (does the program work?) instead of external validity (in what populations, setting, and circumstances does the program work?). An emerging field of dissemination and implementation science has developed in the

past 10 years that can work synergistically with health promotion researchers and practitioners.¹⁰ Understanding the multilevel barriers that impede the diffusion of these programs and their adoption and integration relevant to health promotion stakeholder organizations is a critical need in the field. There are many interventions that have demonstrated efficacy in modifying an individual’s health risk behavior, but we have not paid sufficient attention to facilitating their rapid dissemination, promoting their implementation and sustainment, or understanding how they need to be further adapted for new settings and populations.

Further study is necessary to advance our understanding of how we can better support organizations—including the individual providers, implementers, and organizational leadership—to adopt and use newly developed, innovative health promotion programs. Foremost is the need for an infrastructure responsible for collecting and collating new information, as well as organizing, managing, and coordinating the active transfer of information to practitioners and other consumers (policy analysts, elected officials, health department officials, clinical and social service providers, and program managers in community-based organizations). Resources will need to be identified, mobilized, and committed to the ongoing maintenance and support of the infrastructure that promotes the rapid identification and dissemination of innovative health promotion programs.

There is a clear distinction between the passive transfer of intervention programs and the actions required to actively encourage and enable the

implementation of these programs. The transfer of effective strategies for supporting individual and community use of effective health promotion programs is not automatic. Rather, it is optimized by an active and purposive application of skills, systems, and resources dedicated to supporting the transfer, uptake, and, ultimately, sustainability of new prevention programs. Thus, gaps and inadequacies in the infrastructure responsible for supporting the transfer and promoting the uptake of new and innovative health promotion programs will clearly limit how efficiently systems and processes can be designed, implemented, maintained, and evaluated. Without a competent and fully operational infrastructure for dissemination, it is doubtful that health promotion interventions will be sufficiently translated to fulfill the promise of enhancing individual- and population-level health.

In a period of reduced public health funding and challenging legislation, it is essential that the public health agenda be guided by innovation and interdisciplinary approaches. The unique Turning the Tide conference offered an array of innovative methods, tools, and technologies to combat today's complex public health challenges. The three themes identified and briefly discussed here illustrate progress but also offer innumerable opportunities for further advancement and collaboration. To fully achieve the promise of public health promotion, we must seize this moment, expand transdisciplinary collaboration, and support innovation. **AJPH**

CONTRIBUTORS

All authors made substantial contributions to the conceptualization of the topic and drafting of the manuscript.

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this article.

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